

# ROTUNDA

*the magazine of the Royal Ontario Museum*

**ANCIENT  
EGYPT AND  
NUBIA**

**THE ROM'S  
NEW  
GALLERIES**

**SMOKING  
A COCONUT**

**THE ALLUSIVE  
HYDROID**

**MEDIEVAL  
TORONTO**

**TOURMALINE**

**THE  
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# ROTUNDA

*the magazine of the Royal Ontario Museum*

Volume 24, Number 4, Spring 1992

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at the Royal  
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PHOTOGRAPH BY  
EDWARD GAJDEL





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The Ordinary*

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## ❖ EDITOR'S NOTE ❖

IN THE SEVEN YEARS THAT I've worked at the Royal Ontario Museum, there have been times when I've felt the spine-tingling thrill of seeing something absolutely hit the mark. My visits through the new

Ancient Egypt and Nubia Galleries gave me great pleasure; so did watching the faces of others who were seeing them for the first time. What I'm trying to say is the galleries are terrific.

The ROM's Nubia Gallery displays the Museum's collection for the first time, and it is, in fact, the first Nubian gallery in North America. The Egyptian collection had not been extensively displayed since the closing of the previous gallery in 1979. Continuing the "mankind discovering" theme of all new ROM galleries, the Ancient Egypt and Nubia Galleries explain, through the exhibition of artifacts, how archaeologists have pieced together a picture of societies evolving over the millennia. They also make one imagine what there is still to learn. The portrait of Nefertiti on the cover of this issue is but one small Egyptian treasure on display. If you have not already had the opportunity to visit the galleries, I hope the feature article will inspire you to do so.

In this vein of discovery, the ways in which archaeologists decipher what happened in ancient times is the underlying theme of the article by ROM archaeologist Ed Keall. Keall, like many of his colleagues working in the Middle East, has pondered the function of grenade-shaped objects found at sites in Yemen and elsewhere. His research has concluded that Middle Easterners may have taken up the habit of smoking long before the introduction of tobacco, and may have used a most unusual device to do so.



Toronto is far from ancient but the study of its nineteenth-century architecture exposes links that date as far back as medieval times. Malcolm Thurlby, an architectural historian from York University, explains why me-

dieval architecture was such a great influence on the builders of both religious and secular buildings in the last century. Toronto has changed so rapidly since then that much of what remains of its older buildings and their history is overwhelmed by modern architecture. It's one thing to lose track of ancient cultures for hundreds of years and quite another to lose track of our own after mere decades. Fortunately, historians like Thurlby can keep us informed.

In their articles, John Kenny and Pat McKeown turn the focus from human accomplishments to natural phenomena. Kenny writes about tourmalines, a group of mineral species with crystals that come in a dazzling array of colours and sizes. Mining them is an exciting venture, for tourmaline crystals are found lying loose in pockets; miners simply reach in and extract the crystals by hand.

McKeown writes about the research of Dale Calder, a ROM zoologist with a passion for hydroids. Hydroid is the name given to a phase in the life of marine animals known as hydrozoa. As hydroids these animals look much more like plants, and, in other phases of their lives, they look like completely unrelated species of animals.

From the wonders of human accomplishment to the wonders of the natural world, I hope you enjoy this issue of Rotunda.

*Sandra Shaul*

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# ✠ GROWING COLLECTIONS ✠



*One of the beautiful floral-embroidery patterns from the eighteenth-century album acquired by the ROM.*

## **Album of eighteenth-century floral-embroidery patterns acquired by the ROM**

During the eighteenth century, clothing for the well-to-do was distinguished by brilliant embroidered decoration. The embroiderer's art turned smartly cut jackets and billowing dresses into silken feasts of colours and patterns, personalized for the wearer. The most popular designs were stylized strips of floral decoration in which the embroider-

er simply enhanced the natural colourful appearance of flowers and vines.

In early 1989, through the generosity of Mrs. Mona Campbell, the European Department of the Royal Ontario Museum acquired an eighteenth-century portfolio of 25 water-colour and gouache drawings of patterns for floral embroidery as an addition to our growing collection of drawings related to eighteenth-century decorative arts. The portfo-

lio was in an album covered in seventeenth-century red Genoese silk brocade. Seventeen of the drawings were bound into the album and another eight were simply placed inside. The bound drawings are fairly large, ranging from 30 to 40 centimetres in width and from 100 to 140 centimetres in length. Although some are badly wrinkled, they all still have their original glowing colours.

The patterns indicate different



ways in which embroidery was used. Some are models for the decoration for men's vests or waistcoats. Others are clearly for jackets. Several of the designs seem to be for the edges of a woman's apron. In the late eighteenth century, the apron was not simply a utilitarian covering to keep the dress beneath from getting soiled. It was also a decorative accessory for upper-class women. Aprons were made of fine cotton muslin with elaborate coloured-silk embroidery. Some of the other patterns in the book may be for embroidery on a *fichu*, or shawl, which like the apron had evolved into a purely decorative garment.

Three of the drawings in the portfolio were executed in black rather than in colour. Instead of showing patterns for black embroidery, these are thought to be designs for white-on-white stitching, which would have been a challenge to show otherwise. Textile designers in the eighteenth century had developed many similar techniques for

representing texture rather than colour in cloth.

Although the drawings are clearly related to embroidery used to decorate clothing, it was not immediately obvious where they were made or what role they played in the manufacturing process. Clothing and embroidery styles at that time were international, and it is often hard to determine the provenance of works by style alone. The drawings were described as "possibly French" when purchased by the ROM, but they are not as delicately drawn as would be expected for French work of this period. Luckily the paper used for the 17 bound designs has very distinct watermarks. There are three, all from the Swiss city of Berne and all dated between 1795 and 1800. Although paper was traded over long distances, it is unlikely that anyone very far from the source would have had paper from three different manufacturers in the same city. However, the drawings which were simply inserted in the album have watermarks that

show the papers were made in England or the Netherlands in the 1790s. This suggests that they may not have originated in the same place as the bound drawings.

As for the role of these drawings in the manufacturing process, they may have been kept in an embroidery workshop as models for the workers or they may have been used by a travelling salesman of fine clothing. The salesman may have taken orders for embroidery on clothing by showing customers his album of drawings. He could then give specific instructions to the workers back at the shop for the execution of the design. The fact that unbound drawings were placed into the album may indicate that the collection was assembled for use in a workshop, rather than to represent the work of one designer. Since the drawings are all from the 1790s and all in a similar style, they were probably assembled at that time.

When the album was acquired, a number of the drawings were badly wrinkled and all had suffered from being folded up into the album covering. Janet Cowan, the Museum's paper conservator, was able to restore them to their original appearance. The drawings were taken from the album and surface dust and dirt were removed. By moistening the pages with water vapour on a specially constructed vacuum table and drying them under pressure, it was possible to flatten the drawings without damaging the watercolour.

Twenty-two of the drawings are featured in the exhibition *A Floral Album: Embroidery Designs of the 18th Century*, in the Feature Exhibition gallery of the Samuel European Galleries. Also included in the exhibition are several examples of eighteenth-century embroidery from the Museum's Textile Department, which allow visitors to compare these patterns to the finished works.

HOWARD COLLINSON

*Howard Collinson is associate curator in the European Department, Royal Ontario Museum*



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*Traditional Portuguese boats known as barcos rabelos transport port wine down the Douro River.*

## The Pleasures of Port

*Sip your spirits and cure your cold, but I will take port that will cure all things, even a bad character.*

William Makepeace Thackeray  
(1811-1863)

THAT QUOTE COMES NATURALLY from an Englishman, for port has long been called “the Englishman’s wine.” But make no mistake; when I say port I am referring to the real port that comes from the wildly beautiful Douro Valley of Portugal, where nature shapes a wine in its own strong image. Although man has manipulated nature’s bounty through technology over the years, port remains a unique wine that reflects its origins in the desolate, schistose soil of the upper Douro and its upbringing in the quiet lodges of Villa Nova de Gaia.

The English association with Por-

tugal began in 1386 when the Treaty of Windsor was signed in London giving English and Portuguese citizens the right to trade freely in each other’s countries. Wool and cod for olive oil and wine seemed a fair exchange. The alliance was strengthened further when England fell out with France and the drinking of claret was considered very unpatriotic. The first “Red Portugal” to be exported came mainly from the Minho district in the north and was usually thin and astringent. English wine merchants began to explore further inland in search of a better and bigger wine. They liked what they tasted in the Douro Valley and, as an added advantage, the river, though untamed and hazardous, was available for transportation. By 1700 the English shippers were firmly established at Oporto, send-

ing thousands of pipes (a pipe equals 534 litres) across the sea to assuage the growing British thirst. Today the port wine industry is controlled by the Instituto do Vinho do Porto and dominated by United Kingdom breweries and multinational corporations; the biggest market is France. Although many changes have occurred in the production of port over the years, two things remain constant—the beauty of its birthplace and the pleasure in its drinking.

Port comes from the oldest officially demarcated wine region in the world, the rugged, mountainous country in northeast Portugal, about 100 kilometres upriver from the city of Oporto. The vineyards, protected from the Atlantic humidity and storms by the Serra do Marao mountain range, have been

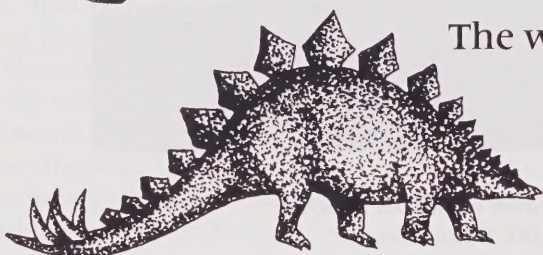
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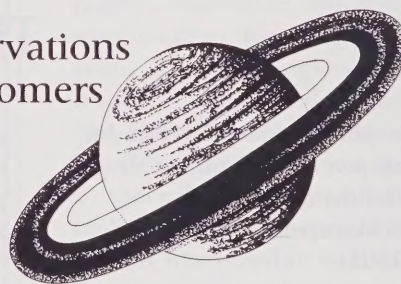


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blasted and terraced out of the rugged, schistose mountainsides. Where little else will grow, vines thrive, sending their roots deep into the rocky ground. The climate also, with miserably cold winters and fiercely hot summers, helps to give the grapes a mature character. The harvest, which takes place from mid to late September, is a time of celebration.

A few of the *quintas*, or wine-growing estates, still keep the traditional practice of treading the grapes by foot in open stone tanks, or *lagares*, to the accompaniment of some local musicians, but modern vinification methods predominate. About half way through the fermentation, grape must is run off into vats, where pure grape brandy is added in the ratio of 80 per cent must to 20 per cent brandy. This fortification process halts the fermentation, leaving a great deal of natural grape sugar in the wine. Thus a young port is born.

After spending the cold winter months in the *quintas*, where the cold temperatures cause the wine to clear, the port is sent down the valley to the shippers' lodges (warehouses) at Villa Nova de Gaia, the town opposite Oporto, at the mouth of the River Douro. Before the building of the railway and highway, port was shipped down the river in flat-bottomed boats called *barcos rabelos*. Nowadays the river supplies hydro-electric power and the port travels by truck. On arrival at Villa Nova de Gaia the wines are graded by the tasters and earmarked for the blending of particular styles of port. Then they begin the long, slow process of maturation, some in wood and some in bottles.

The great majority of port is wood-aged in oak casks or giant oak vats, which impart a pleasant nuttiness and roundness to the wines. Wood-aged ports are bottled when ready for drinking and should be consumed within 18 months to two years after bottling. These include white, ruby, Tawny, Vintage Character, Late-Bottled Vintage, and Old Tawny with its designation of age.

## THE ART OF *R*EFRIGERATION

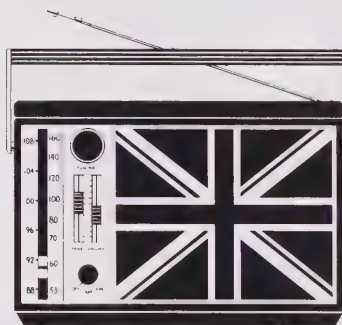


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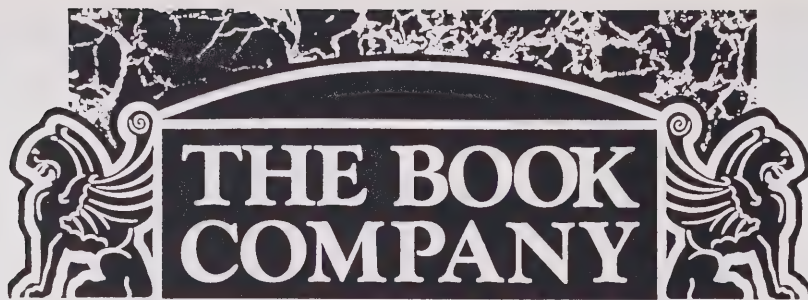
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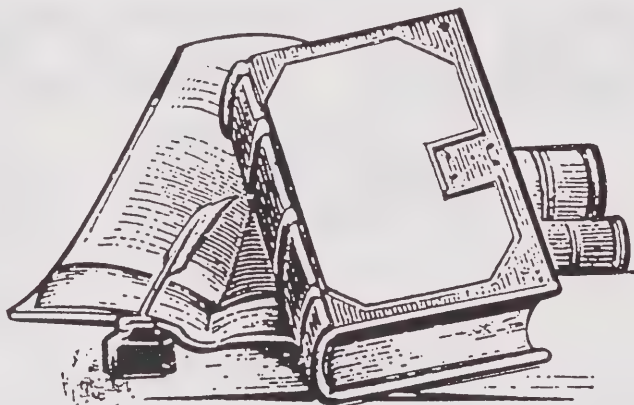


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### WINE AND CULTURE CONTINUED

Ruby and Tawny are the youngest ports with an average of three years ageing; they are fresh and fruity in style and are appreciated best as aperitifs, served chilled or even mixed with soda. White port is produced from white grapes and is very often fully fermented before fortification, resulting in a dry style. As most visitors to Portugal discover, chilled dry white port is one of the world's great undiscovered aperitifs, especially when served with fresh-roasted almonds or little codfish hors d'oeuvres called *bolinhos*. Vintage Character, a full-bodied, complex wine blended from ports of different years with an average age of six or seven years in wood, is a superb after-dinner drink. Late Bottled Vintage (known in the trade as LBV) is port of a single year of good quality, matured in oak for five or six years and bottled after a light filtration; it is ready for immediate drinking and, unlike Vintage port, does not need decanting. Similar in style to Vintage port, LBVs offer very good value and do not require the long waiting period before enjoyment. Old Tawny, my favourite and, according to one producer, the most challenging to make, is port aged for 10, 20, 30, or 40 years during which time it loses its deep colour and acquires a fiery, amber glow. Complex, nutty flavours develop, which go perfectly with *pudim flan*, the Portuguese version of creme caramel.

Many port lovers consider Vintage port to be the king of all ports. Indeed a shipper's reputation is established by the quality and style of his Vintage port. Bottled after two years in cask, Vintage port needs some 15 to 20 years to reach maturity. A vintage is normally declared only three or four times every decade when the weather has been perfect and the wine has been made under ideal conditions. A shipper will select only the finest wines from his very best *quintas* for Vintage port, wines that are intensely coloured, with plenty of fruit and body and sufficient tannin, or grip,



to enable them to withstand long ageing in bottle. Vintage port must be stored in a cool place at a constant temperature, with the bottle lying horizontal so that the cork does not dry out. It will throw a sediment, or crust, and therefore must always be decanted. Several hours before serving, the bottle should be stood upright to allow the crust time to sink to the bottom; then the wine should be poured carefully, in front of a bright light to ensure that no sediment escapes, into a clean decanter. Recently some firms have been offering Single Quinta Vintage Port, wines produced in a "non-declared" year from a single vineyard and treated exactly as a Vintage. These ports usually mature faster and offer an excellent alternative to rare and expensive declared vintage years.

The drinking of port has been associated with several traditions, none more talked about than "passing the port." Many accounts have been given for the ceremony of passing the decanter clockwise around the table, from superstition to freeing up the sword hand to Royal Navy regulations, but the probable practical explanation is that since most people are right-handed it is easier to pass the decanter from right to left. A tradition about which no one argues is the serving of port with Stilton cheese, a marriage made in England, although it must have been conceived in heaven. But, please do not dig a hole in the Stilton and pour the port; this uncouth practice ruins both the wine and the cheese.

When Canadian winters strike, head for port and follow this simple recipe. Place a couple of good friends in comfortable chairs; pour port into decent-sized glasses; add a few real nuts such as walnuts and almonds accompanied by a platter of cheese and crackers; warm everything together in front of a crackling fire and enjoy.

GERALDINE RUBINO

*Geraldine Rubino is a food and wine writer living in Toronto*



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# SMOKING

*Archaeologists may have discovered the identity of mystery objects in a puff of smoke*

# COCONUT

EDWARD KEALL

BRIAN BOYLE  
**M**USEUM CURATORS OF ISLAMIC ART COLLECTIONS have long been familiar with sphero-conical-shaped pottery vessels found all over the Middle East. The vessels do not appear in large quantities, but their numbers are sufficient to suggest that they were in common use between at least the

eleventh and fourteenth centuries. They are made of a dense clay fired at high temperatures, which might best be described as "stoneware." The clay's density makes the vessels watertight. Some of them are glazed, and almost invariably they are decorated, sometimes quite ornately. No func-

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*Edward Keall is a curator in the West Asian Department of the Royal Ontario Museum*







tion for these objects has been confirmed, although there are several theories, some extremely imaginative.

Written inscriptions on the vessels include reference to females, and so “perfume flask” is the description most frequently used in museums. The vessels’ sturdiness would have made them suitable for transport by caravan, and so some scholars believe that they could also have been used by men as standard cologne bottles for rosewater.

Among the more outlandish theories about the vessels’ function—again with reference to sturdiness—is the suggestion that they were mercury containers or, perhaps in view of their grenade-like appearance, medieval fire-bombs filled with an ignitable petroleum product. It has even been suggested that they somehow served as fire-blowers in kilns. But each of these theories glosses over the fact that the mysterious vessels are, more often than not, ornate. While the definitive explanation may still be elusive, members of the ROM team of excavators of a sixteenth-century layer in the citadel of Zabid, Yemen, believe that they may have found the answer. Their theory has to do with the habit of smoking and when it began.

It is generally believed that people in the Middle East did not take up the habit of smoking any substance before the turn of the seventeenth century when tobacco was first introduced. Excavations inside the citadel at Zabid, where the ROM project has its headquarters, have yielded a delicate white-bodied pottery, glazed in yellows and greens, which can be dated to the short-lived Ottoman Turkish domination of Yemen from after 1540. The pottery was made at workshops in Hays, a small town near Zabid. Since the pottery includes smokers’ pipes made of the same material, one may even narrow down the time period involved to the years 1600-1635. By 1636 the Turks had been driven from Yemen as a result of growing local opposition. Apparently the custom of pipe-smoking became widespread in Yemen in little more than a quarter of a century.

The introduction of smoking appears to have followed a similar pattern in other

cultures around the world. When the Portuguese first brought tobacco to Japan in the sixteenth century, it caused a sensation. Smoking instantly became fashionable. Tobacco leaf was being traded there in considerable quantities by the 1590s, and cultivation of the plant itself started at Nagasaki in 1605. In his diary, written in 1615, a British naval officer, Captain Rich, declared, “It is strange to see how these Japons, men, women and children, are besotted in drinking that herb [tobacco] and not ten years since it was in use first.”

Tobacco, *nicotiana tobaccum*, was first cultivated in the New World where it spread from South to North America. It had a milder flavour than the wild *nicotiana rustica*. In North America the idea of using pipes to smoke tobacco travelled throughout the Mississippi River basin. Early European explorers witnessed the practice—including Jacques Cartier in 1535. However, European interest in the plants seems to have been at first purely botanical. *Nicotiana rustica* was cultivated in Lisbon in 1558. The domesticated version, *nicotiana tobaccum*, may have been brought directly from Brazil a little later. There are grounds for suggesting that Sir John Hawkins may have brought *nicotiana* seeds from Florida to England in 1565, at least a decade before the legendary dousing of a smoking Sir Walter Raleigh by a startled servant. Pipe-smoking was common in Europe by the 1580s.

Before tobacco appeared in the Middle East the burning of incense was widespread, and the ancient Persians may have inhaled the fumes of hallucinogenic plants, which they called *haoma*. The narcotic properties of hashish were well known in medieval Islam, but scholars believe that it was always ingested in pellet or powder form.

Archaeologists have never found artifacts in medieval contexts that could be convincingly associated with pipe-smoking. In Iranian Kurdistan, to the Western eye, traditional elbow-shaped clay pipes sold in the bazaars look as if they should be used for smoking, but they are actually devices inserted into the bottom of a baby’s cradle to allow urine to drain out. (An American visitor who bought one of these pipes and put it in his mouth was greeted by hoots of laughter from Kurdish bystanders.) Indeed, an archaeologist finding one of these on a medieval site might easily be deceived into thinking that exceptionally ear-



A storekeeper  
smokes a  
Yemeni Archaic  
dry pipe.

PHOTO COURTESY OF GUILLAUME ROPARS



ly evidence of smoking had been unearthed.

Genuine smokers' pipes have been recovered from excavated sites where settlement dates from the fourteenth and fifteenth centuries. In these instances, however, it is clear that, without exception, archaeologists have recovered pipes of much more recent date from the loose top layers of the sites and have erroneously attributed them to the earlier layers. They have relied too heavily upon historical accounts that speak of the abandonment of the sites, and have ignored the fact that ephemeral settlements may have occurred in much later times, for which the only remaining tangible records are a few discarded pipes that should be placed in their more appropriate eighteenth- and nineteenth-century time frames.

Scholars point out that no contemporary Middle Eastern texts speak openly of hashish being smoked before the habit of tobacco smoking was introduced, an observation which adds strength to the theory that smokers' pipes were not used before the seventeenth century. This reasoning is further supported by the history of opium use in China. It appears that opium was never smoked before the introduction of opium-watered tobacco by the Dutch. Before that time the Chinese only ingested opium in the form of pills or liquids. During the early Ming period tobacco smoking acquired a special notoriety in Shansi province because soldiers found that those who smoked were less susceptible to malaria. This was obviously more a tribute to smoke as a mosquito deterrent than to tobacco's medicinal properties.

Back in the Middle East, although hashish, known as *semsemī*, was listed in ancient Egyptian medicines as an ingredient in various compounds used for poultices or as-tringents, there is no indication that it was thought of as a major active ingredient. However, in eleventh-century Iran there was a group of religious fanatics who advanced their cause by murdering those who opposed them. They may have used hashish both as an inducement to potential followers of the sect, as well as to

strengthen their resolve in facing their foes. In Persia these hashish users were called *hashshashin*, from which the word "assassin" is derived.

By the thirteenth century the narcotic properties of the cannabis plant were well known to pharmacists in the Islamic world. Hashish was listed as an import item subject to excise tax in fourteenth-century Aden, and around the same time Marco Polo and other European travellers learned of the stupefying properties of the drug. On the other hand, the first circumstantial evidence usually cited for a Middle



Easterner's awareness of tobacco smoking dates to an incident in 1599, when a Turkish sea captain is reported to have boarded a British ship in the Dardanelles and asked for a smoke.

The belief that Middle Easterners did not smoke tobacco before the seventeenth century is reinforced by the number of formally expressed Islamic religious opinions

*Man Smoking a  
Kalian, Riza  
Abbāsī, c. 1630*



(*fatwahs*) concerning the lawfulness of smoking. Beginning with his appointment as the supreme head of the Ottoman state in 1623, Sultan Murad spoke out strongly against the right to smoke, even though smoking was relatively common in Turkey from about 1605. In contemporary illustrations of gatherings of court dignitaries and royal receptions there is little evidence of smoking apparatuses, although there are bold portrayals of dancing and what is probably the consumption of wine. It is only in the coffee-house illustrations of the eighteenth century and later that smoking seems to have become a moderately respectable pastime.

Yet it is important not to conclude too quickly that lack of evidence should be read as the absence of smoking. Because of its proximity to the Indian Ocean Yemen may have been introduced to tobacco smoking by the Portuguese well before 1600. Although such a theory is difficult to substantiate, it is quite possible that tobacco was brought by sailors to Madagascar and the Indian Ocean even earlier than to Europe, almost as soon as the Portuguese had rounded the Cape of Good Hope in

1498. However, the fact that the Turkish governor was smoking tobacco in Yemen in 1604 seems to fit nicely with other Middle Eastern experiences of tobacco. And a seventeenth-century Yemeni source speaks of the introduction of the tobacco plant to his country in 1590.

One crucial point can be gleaned from the Yemeni text: people invented ways of smoking tobacco "with water," while others smoked it dry. In fact this source claims that smoking tobacco through a dry pipe was superior to using a water vessel. That there were two different methods of smoking in seventeenth-century Yemen may seem a very unremarkable observation. The image of the *hookah* or hubble-bubble pipe in association with the Middle East is so well known as to be a cliché. But the important point is that there are no known antecedents for the water-pipe outside the Middle East. The Europeans, who smoked tobacco before the Turks, did not use the water-pipe, nor did native Americans. Africa and the Far East adopted the water-pipe tradition, but only after

the introduction of tobacco.

Two Safavid Persian portraits of females in private garden settings, attributed to the artist Muhammad Qasim of Tabriz and dated 1640 to 1650, are among the earliest Middle Eastern illustrations of smoking that include the use of the water-pipe. The pipes are characterized by a small device held on top of the globular water-container through which the smoke is drawn by means of a reed. This is a subtle difference from the pipes shown in nineteenth-century illustrations and still seen in Middle Eastern tea-houses today, where the water containers have been manufactured with a spout to accommodate the pipe-stem.

It is a small but significant difference. The act of smoking is the same; smoke is drawn down from the burning tobacco, through the water which cools it, and up through the stem. In the earlier pipes, however, any globular container could be used as a water-carrier, while in the later versions a special vessel must be made.

There is a common element between the devices shown in the Safavid portraits and the pipes excavated in Yemen. In addition to the green-glazed pipes found in the Zabid citadel and in the same sixteenth-century context, there were unglazed, but carved, smoking devices that bear a remarkable resemblance to the devices shown on top of the Persian water-containers. Unfortunately forensic analysis of the residues found inside the pipes failed to produce any trace that would indicate whether a cannabis or nicotine-based product was being smoked. However, what is remarkable is that two completely different ways of smoking—with dry pipes and water-pipes—have been confirmed in a region decades before the date given in modern standard historical interpretations for the introduction of smoking. This corresponds well with the comments of the seventeenth-century Yemeni writer who cited the 1590 date for the introduction of tobacco.

What is the origin of the water container shown in the Persian paintings and thought to have been used on the Yemeni carved pipe tops? There are other Arabic terms used quite frequently for the *hookah* or water-pipe, including *ghaliun*. The word *ghaliun* (which has also been adopted as a Persian word) is derived from an Arabic verb meaning "to boil," which can easily be associated with a kettle-shaped water vessel

**D**o the enigmatic objects represent ceramic coconuts?



adapted for smoking. But the real answer may lie in the Turkish word *nargile* and the Persian word *nargilah*, which mean “water-pipe” and are both derived from a Hindi and originally Sanskrit word *nariyal/narikela*. The original meaning of the Indian word is “coconut.”

A word based on the same sounds is used in India today for smoking devices, although it is possible that in reference to the water-pipe the word took a circuitous route, returning to India during the Persian military occupation in the eighteenth century. However, there is a fascinating association with the Indian-derived terms and *mada'ah*, the Yemeni word for water-pipe, which since the eighteenth century has been associated with the idea of banqueting and the ritual of smoking after the meal in a social gathering. The word *mada'ah* originally meant coconut.

It is obvious from both the Indian/Persian and Yemeni words that a coconut may well have been one of the earliest items used to provide a water container for a smoking pipe. In a similar way, even a villager in the Middle East today will use a gourd as the water container for a *hookah*, rather than the fancier glass or metal containers sold in city markets. In fact, the globular shapes of the delicate glass vessels shown in the 1640 Persian miniature paintings may well be derived from the coconut.

Of course, if there was an indigenous tradition, established in the Middle East well before 1640, of using coconuts as the water-containers for smoking pipes, it is possible that Persians (and perhaps Yemenis) did smoke substances other than New World tobacco before 1600. When the Portuguese or others brought tobacco, it would have been the easiest thing in the world to substitute this new product for the old substance, which was probably hashish.

Archaeology has provided an opportunity to learn about issues about which no one would write at the time. There are religious polemics against the use of tobacco from the seventeenth century, yet there are none against the smoking of hashish.

Conceivably it is because tobacco smoking became so much more popular and was practised in public. Dare one suggest that the habit of smoking hashish remained more popular with women, who carried out their activities in the privacy of their



gardens and homes, and in so doing did not offend the male clerics?

As for the enigmatic vessels dating from at least the eleventh to fourteenth centuries, these may well represent ceramic versions of the coconut, and as such reflect a practice in the Middle East of smoking in private, three centuries before the introduction of tobacco. ♡

Portrait of a Persian Lady of the Court of Isfahan, signed "Muhammad Qasimi-i Tabrizi"; 28 x 17 cm; Iran, Isfahan, c. 1640 to 1650.



# STALKING

## THE ATLANTIC HYDROID

*Appearing more plant than animal, the Atlantic hydroid  
is a fascinating creature to study*

PAT McKEOWN



WHEN EMPEROR Hirohito of Japan died in 1989, the world of marine biology lost an expert on marine creatures that most people have never heard of. The Son of Heaven spent his years on the throne painstakingly carrying out the exhausting routine of the Imperial Household while pursuing with discipline and passion his true love: the detailed study of marine life, particularly the study of Hydrozoa.

Hirohito conducted research in a laboratory built near his personal villa in the Imperial City. Monday and Thursday afternoons and all day Saturday were devoted to marine biology. In addition, he spent one week each summer at a sea-side villa collecting specimens, for Hirohito was a strong swimmer, with spectacular breath control from an early age. No dilettante, he carried out his work himself, and was frequently visited by biologists of international reputation.

So well known was Hirohito's passion for marine biology that under pressure from his staff he gave up his studies during the war as a conspicuous gesture of self-sacrifice and solidarity with his people. His action was publicized as propa-

PAUL HUMANN

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*Pat McKeown is a freelance writer based in Toronto*

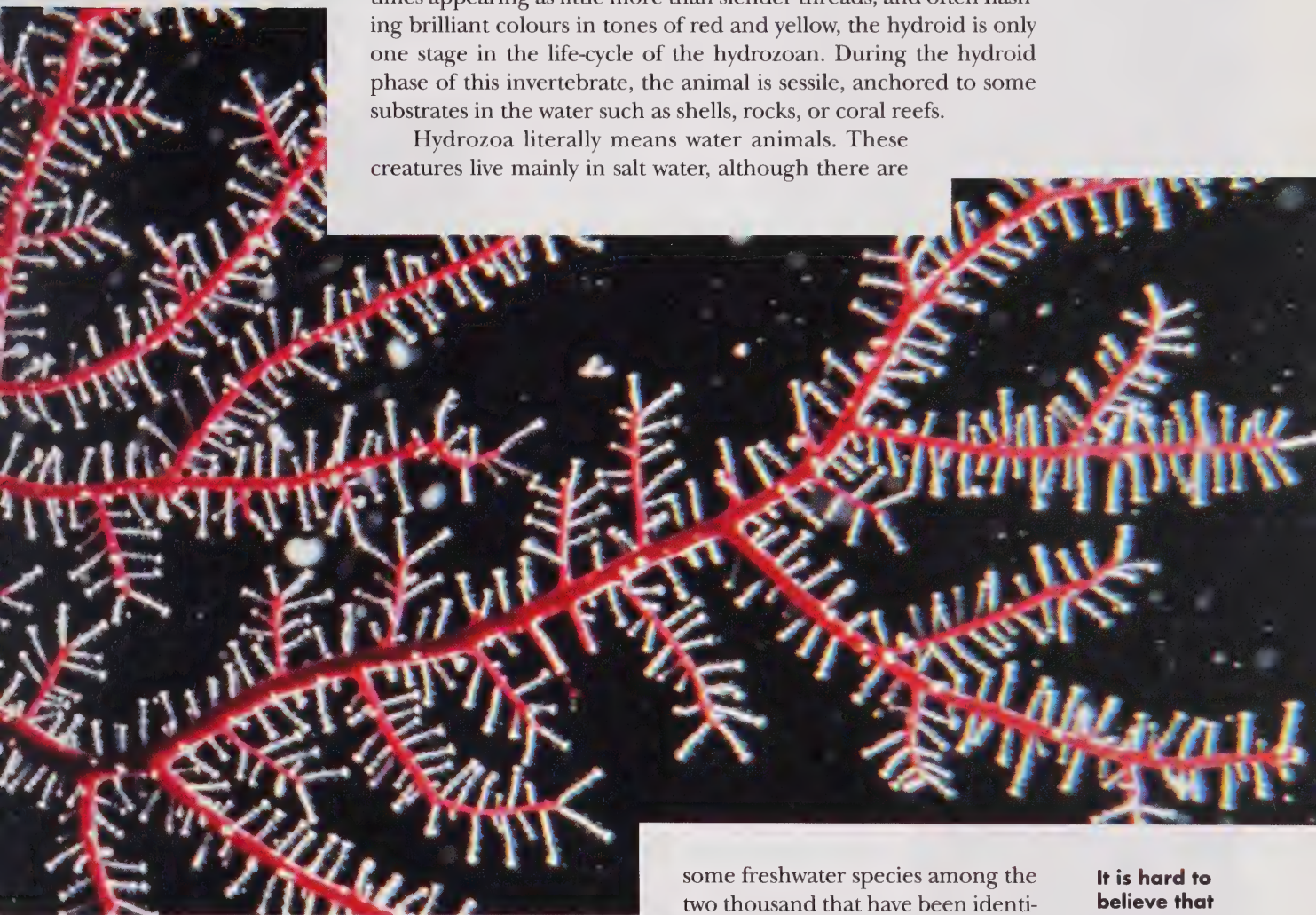


ganda. After the war, his studies in marine biology won him world-wide recognition. Twenty-six of his monographs were published, including one in 1983 with the title *Hydroids from Izu Oshima and Niijima*, in which he writes of spending 52 years studying Hydrozoa.

Dale Calder of the Royal Ontario Museum's Department of Invertebrate Zoology shares the fascination Hirohito had with animals the philosopher Aristotle called zoophytes, or plant-animals. He has focused his attention primarily on the hydroids or Hydrozoa of the Atlantic, from the Arctic to the Caribbean Sea, and especially those of the oceanic island of Bermuda.

Hydroids are marine animals that could have come off the drawing boards of the creators of Walt Disney's *Fantasia*. Sometimes resembling tiny plants with palmlike fronds undulating in waves and ocean currents; at other times appearing as little more than slender threads, and often flashing brilliant colours in tones of red and yellow, the hydroid is only one stage in the life-cycle of the hydrozoan. During the hydroid phase of this invertebrate, the animal is sessile, anchored to some substrates in the water such as shells, rocks, or coral reefs.

Hydrozoa literally means water animals. These creatures live mainly in salt water, although there are



some freshwater species among the two thousand that have been identified world-wide.

In the hydroid stage of the hydrozoan, the animal is usually colonial. When the colony is flourishing, some species produce little buds that eventually detach from the hydroid as tiny jellyfish or medusae. "The medusa or jellyfish stage of the hydrozoan looks almost totally unlike the plantlike hydroid, so you can't tell that one comes from the other unless you have seen the metamorphosis happening," says Calder. It was not until the 1830s that the link was made between the two apparently unrelated creatures. "We're still working out life-cycles today, trying to link up all the hydroid stages with their respective medusa stages."

Calder has specialized in studying the hydroid stage of Hydrozoa. "If I'm uncertain of the identification of a hydroid and it has a jellyfish stage, it sometimes helps to culture the medusae so you can identify the species." When the great

**It is hard to believe that the plantlike seatan hydroid, *Solanderia gracilis*, which is found off the Cayman Islands, is an animal.**



natural science collections were begun in the eighteenth and nineteenth centuries, the hydroids were given to one specialist to identify, while the medusae were given to another. Separate names were applied to the two stages, and different systems of classification developed for hydroids and for medusae, which scientists are still working to unify.

Most of the large jellyfish we encounter while swimming or fishing, such as the white Moon Jelly seen off the Atlantic and Pacific coasts, or the venomous Sea Nettle so abundant in Chesapeake Bay, belong to a different group known as Scyphozoa. They are distinct enough biologically from the small hydrozoan jellyfish to be referred to as a separate class.

Although hydroids look like plants, they are definitely animals. Unlike plants, hydroids do not produce their own nutrients: they have no chlorophyll in their tissues, but live on prey captured from the water. Anatomically they are also clearly animals, with an epidermis or skinlike outer covering, and an inner layer called the gastrodermis. They also have a digestive system and a primitive nervous system.

Hydrozoa in the hydroid stage are typically colonial animals: each polyp is complete in itself while at the same time connected to others in the colony by a tube of living tissue. This hollow tube links up each of the hydranths, or polyps, so that when one feeds, food is digested and then shared with other parts of the colony. Calder describes them as "communitistic," because the whole colony benefits from what each individual hydranth consumes. As long as the colony remains healthy and well fed, other hydranths will develop and the hydroid continues to grow.

Hydrozoa reproduce in two ways. The first polyp in a colony results from the metamorphosis of a larva produced by sexual reproduction. Polyps, or hydranths as they are usually called, then bud asexually to form the colony. Eventually there may be hundreds, and in some cases thousands, of hydranths in a colony. Growth is superficially like that of a plant at this stage.

When conditions are favourable, when the temperature and salinity are just right, and when the food supply is abundant, the hydranth in some species will put out another kind of bud, called a medusa bud. This bud develops and eventually breaks loose to become a free-swimming jellyfish. Each jellyfish exists independently, unlike its stationary, colonial predecessor. The medusa is not strong enough to swim against the current but is carried along by the flow of the water.

Sexual reproduction occurs when male and female jellyfish, usually present in large numbers, shed their gametes into the water. Fertilized eggs develop into larvae. In some species, male gametes attach to the female, which may retain the eggs until they hatch. The larvae swim to the bottom or to some other substrate and develop into the polyps that gradually form the hydroid colony. The cycle continues.

However, only some 700 of the 2000 species of Hydrozoa pass through the medusa stage to reproduce sexually. In most, the medusa bud or gonophora

Looking more like an underwater snowflake, the Christmas tree hydroid, (centre) *Halocordyle disticha*, is found off the Cayman Islands.

*Halopteris carinata* is shown in the polyp or hydranth stage of the hydrozoan. Hydranths bud asexually to form the plantlike colony known as a hydroid.



PAUL HUMANN



is never liberated from the colony, but sheds its gametes into the water where fertilization occurs. The larvae develop as usual, eventually giving rise to new hydroid colonies. While most colonies are either male or female, those of a few species are hermaphroditic.

Hydrozoa belong to a large group of invertebrates, called Cnidaria, that includes jellyfish, corals, and sea anemones. All Cnidaria share a unique and remarkable characteristic: they are armed with cnidae or stinging capsules, also called nematocysts, located mainly on the tentacles but also scattered over other parts of the animal's body.

These capsules are complex microscopic structures produced by a single cell, and are loaded with venom that is usually innocuous to humans. Many species have several different kinds of nematocysts. Calder compares them to a weapons system: "The varieties of nematocysts on a cnidarian may serve different functions: one kind may penetrate the prey and immobilize it; another may entangle it, and another may kill it." Once captured, the prey is swallowed whole and digested by enzymes. Nematocysts serve for food gathering but they also function as a defence mechanism. "A considerable amount of the success of this group must be attributed to the defensive benefits they derive from this system," says Calder. The most venomous marine animal known is a jellyfish from Australia called the deadly Box Jelly, which can kill an adult human. Another familiar cnidarian with a toxin harmful to humans is the Fire Coral, which is not a coral at all, but a hydroid with a calcium carbonate skeleton. The "fire" in its name comes from the hydroid's toxicity. If you brush up against it while you are diving on a reef, the sting feels like a severe burn.

Nematocysts occasionally turn up in the strangest places. Some sea slugs graze on hydroids, yet the stinging capsules fail to discharge, even during digestion. The sea slug incorporates the intact nematocysts of the otherwise digested hydroid into its own body: the capsules move to the surface of the sea slug's skin and help the slug defend itself. It's not the hydroid itself that's still living, but only a portion that didn't get digested.

Calder was first drawn to the study of hydroids in graduate school in Virginia. One of his professors had a contract with the United States Navy to study marine life clogging the cooling systems of nuclear-powered aircraft carriers.

According to Calder hydroids were one of the two major groups creating problems for the navy. Working on that contract, he discovered that what was known about hydroids was decidedly inadequate. "The more time I spent studying them, the more I realized how little was known about these animals," he admits.

Once Calder and his colleagues discovered where the ships were picking up the hydroids, the problem was easy to solve. The navy had dredged out areas adjacent to the docks, forming a deep basin. During heavy winds and rough weather, many hydroids broke off from their substrates around the harbour, and eventually settled in these basins. The ships' water intakes sucked them in



RONALD J. LARSON



KATHLEEN S. LARSON

***Cladonema radatum* (top) and *Eperetmus typus* (bottom) are hydrozoa shown in the medusa or jellyfish stage. They grew from medusa buds put out by hydranths under certain favourable conditions. During this stage hydrozoa reproduce sexually.**



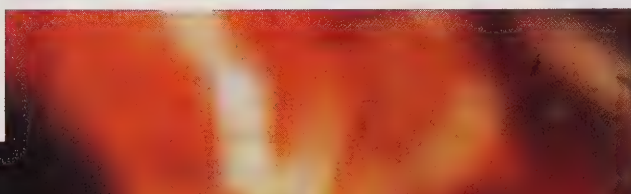
**The hydroid  
*Halopteris  
carinata* is  
growing on a  
red sponge.**



like vacuum cleaners.

The solution to the problem was to dredge the basins after a storm, cleaning out all the hydroids. "There were other suggested solutions to the problem, including some really nifty ones involving air-bubble systems, but these solutions were so complex and costly that the navy decided to go with the easy solution," says Calder. "For less than a thousand dollars they could have a commercial crab fisherman come in with his dredges and clean out the basins in a day or two."

Calder went on to complete a doctorate on the hydroids of Chesapeake Bay, determining which species live there, working out some of their life histories, and trying to determine their seasons of activity. It is just as well that



the intellectual and aesthetic pursuit satisfies Calder because he admits that hydroids do not have much practical application to humans. "They're important to the web of life on the planet. They're predators, feeding mainly on plankton. They serve in turn as food for other organisms like fishes and sea slugs."

Most people have never heard of hydroids even though they often cause problems similar to those created by the zebra mussels now infesting the Great Lakes. Hydroids too can clog water intakes or attach themselves to ships, hampering their ability to move through water, increasing energy expenditure.

Calder currently has a contract to study a hydroid causing problems at a nuclear power plant in Virginia. The species impedes the flow of water into the



**The hydroid  
*Dentitheca  
dendritica* is  
growing on a  
coral reef.**



plant, water necessary for cooling during the production of electricity. The problem is a multi-million dollar headache because the plant faces temporary shut-down if the reactor overheats, and the loss of millions of dollars in revenue if that happens. The same problem faces several other nuclear power plants from New England to the Gulf of Mexico.

Species of hydroids are identified by examining an array of characters: the hydranths, the tentacles, the reproductive structures, and the colony form. In one group of hydroids, the shape of a protective cup around the hydranth is important. This cup, called a hydrotheca, is sometimes quite ornate, with little teeth on the margin. They almost look like little goblets and the hydranth or polyp fits right inside it.

The cup is formed of chitin, a substance almost like a fingernail. Although not as hard as the exoskeleton or shell of a lobster, it is still firm enough to offer some protection. To a fish it might present no problem but to an invertebrate, say a sea slug, the hydrotheca would protect the soft part of the animal from predation.

**The hydroid *Zyzyzus warreni* is growing on a grey sponge.**



Unfortunately for the hydroid, the hydrotheca is no defence against predators armed with a long beak or proboscis. Sea spiders, which are not true spiders at all, just poke their beaks into the hydrotheca and feed on the soft part of the hydroid hidden inside.

There is an aesthetic pleasure in the study of hydroids, not the least of the joys of pursuing these little-known animals. Some athecate species resemble delicate flowers, others mimic underwater fungi; some look like feathers, while others, small and delicate and not more than a millimetre in height, can hardly be seen with the naked eye. Many of the athecate hydroids are brightly coloured—red, yellow, and even blue. As Calder explains, "Sometimes you see a

PAUL HUMANN



THE  
SCIENTIFIC  
IMPORTANCE  
OF ALL  
SPECIES OF  
ANIMALS,  
BIG AND  
SMALL, IS  
INCREASING  
AS MORE  
AND MORE  
OF THEM  
DISAPPEAR  
FROM OUR  
PLANET

blotch of colour, others are so small you don't see the colour until they're under the microscope and then the subtle colours just jump out at you. That's part of the joy of working with living material."

For the past ten years, most of Calder's work has focused on the hydroids of Bermuda where he has found more than 101 species. Snorkeling and scuba diving have been his principal exploration tools there. He has collected extensively to depths of 100 metres off Bermuda. As a result, he expects to concentrate his research over the next couple of years in much deeper waters, a daunting prospect. Bermuda is an extinct volcano and the bottom just drops off precipitously. It's very difficult to pull sampling gear like dredges or trawls over the edge of an underwater mountainside. A research submersible would be invaluable but the funds are just not available for such a costly venture.

While the hydroids of Bermuda have occupied most of Calder's time in the past ten years, other field trips such as those to the Central American country of Belize in 1987 and 1990 have injected some variety into his research. The Canadian marine biologist was invited to work at a field station run by the Smithsonian Institution off the coast of Belize, which boasts the longest barrier reef in the Atlantic. The reef is still relatively unspoiled despite some commercial fishing. For this reason, the Smithsonian chose it as the focus of studies on reefs and their ecosystems, including mangrove swamps.

Mangroves are trees with large, visible roots growing above and below the surface of salt water in rather sheltered areas. The area among the roots is organically rich as a result of the decay of fallen leaves. Calder describes the mangrove forests as a nursery ground where the mangrove trees provide ideal conditions for the larval and juvenile stages of the many species around the reef, and hydroids are fairly plentiful on the roots that anchor the trees.

Calder was surprised at the diversity of hydroid species to be found there. Literature on mangrove systems largely describes conditions in the Pacific, and indicates that few species of hydroids live in that habitat because of the range of the tides. When the mangroves are high and dry at low tide, conditions are not at all favourable to hydroids.

"I was a little worried initially that I would be taking the Smithsonian's money and giving them little information in return, because I just didn't know if there would be hydroids in the Belize mangrove swamps at all," he says. Calder need not have worried. He found dozens of species of hydroids on the first trip.

Although we do not yet know of any significant human use for hydroids, they may have potential as environmental indicators because they are sessile or fixed: they cannot swim away if conditions become unfavourable. Calder has conducted some studies on the way in which salinity affects the distribution of hydroid species in an estuary, finding there are major changes along a gradient from full sea water to fresh water. Hydroids are mostly marine, so there is a rich assemblage at the mouth of an estuary and a very poor assemblage at the head where fresh water begins. The salinity regime in an estuary can be predicted from the species that are there. And by the same token, pollution stress may influence which species occur in an area. However, Calder says not enough research has been done yet on how hydroids could be used as an environmental indicator.

Most of the taxonomic work being done on hydroids today is done in museums such as the British Museum (Natural History), the Natural History Museum in Leiden, and the ROM, which houses one of the five largest collections of these animals in North America. Museums are institutions that have the resources to care for the natural history collections donated over the years by independent researchers and also developed by museum staff.

However, museum visitors seldom see hydroids on display: instead they are kept in the collection rooms, in jars filled with formaldehyde or alcohol, ready for scientific study. As Calder says, "Hydroids aren't likely to be exhibited: they're not very attractive when they're preserved. But the scientific importance of all species is increasing as more and more of them disappear from our planet." ♡





# CHANEL

131 BLOOR STREET WEST - TORONTO

755 BURRARD STREET - VANCOUVER



# THE CITY INSPIRED BY A SAINT, BUILT BY AN EMPEROR AND ABANDONED BECAUSE OF A FREAK OF NATURE.

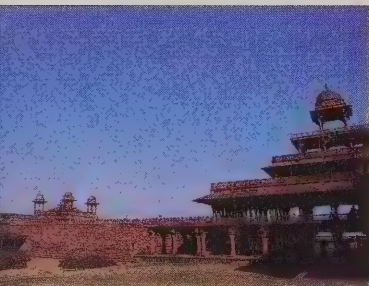
*This is the story about the most beautiful ghost city in the world.*

*Our tale begins over 400 years ago when northern India was ruled by a Moghul emperor named Akbar. One day, according to legend, Akbar left his palace city of Agra and made a 40 km pilgrimage to visit a saint named Shaikh Salim Chishti. The holy man then predicted the birth of three male heirs to Akbar's childless wives. As a*



*tribute to the birth of his first son, Akbar decided to build a new capital city on the very spot where the revelations were made. He named the city Fatehpur Sikri or 'City of Victory.' It took 14 years and 10,000 artisans to complete the Persian masterpiece of red sandstone*

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IT MAY BE A SURPRISE TO LEARN THAT A CITY AS NEW AS TORONTO has links to the Middle Ages, but it is true. The links are architectural and they were first formed in the early nineteenth century. Although at first very few buildings in the city displayed pointed arches, details of their mouldings and tracery invariably reflected the medieval style, albeit the romantic medievalism of the eighteenth and early nineteenth centuries rather than that of the great Gothic edifices of the twelfth to the sixteenth century.

However, after 1850 this situation changed and in no field more dramatically than in that of church architecture. Here Neoclassical and Classical Vernacular styles gave way to the pointed Gothic or to the round-arched Romanesque style of the eleventh and early twelfth centuries. Medieval models became viable alternatives to the classic tradition in some domestic and school buildings and, on occasion, in other types of buildings as well.

The impact of the medieval revival after 1850 is readily appreciated by comparing St. James' Anglican Church (1831-1833), as represented in Thomas Young's view along King Street of 1835, with the cathedral church rebuilt by Cumberland and Ridout after the fire of 1849. The 1831 church conforms to the rectangular boxlike designs created by the English architect James Gibbs, which were popularized through the 1728 publication of his *Book of Architecture*. Its classical detailing conforms happily with the adjacent Court

House and jail. Cumberland's church makes a bolder ecclesiastical statement, one that is inspired by thirteenth- and fourteenth-century Gothic designs with the consistent use of pointed arches and a clear articulation of different parts of the church—the sanctuary, nave, aisles, and tower. Its dominant role in the Victorian urban setting—if not amongst the twentieth-century towers of commerce—was assured with the spire, completed in 1873, according to the design of Henry Langley.

Espousal of the Gothic style for St. James' was not just the whim or fancy of the patron or architect. It conformed to strict tenets for ecclesiastical architecture expressed most forcefully by the English architect Augustus Welby Pugin. Pugin's views were initially articulated in the book entitled *Contrasts: Or a Parallel Between the Noble Edifices of the Fourteenth and Fifteenth Centuries, and Similar Buildings of the Present Day: Shewing the Present Decay of Taste: Accompanied by appropriate text*, which he illustrated, wrote, and published privately in 1836. Subsequent works, such as *True Principles of Pointed or Gothic Architecture* (1843), became indispensable for any architect designing in the Gothic style.

Pugin, a convert to Catholicism, believed that Gothic symbolized true Catholic Christianity, whereas Classicism reflected Paganism. He equated the appearance of Italian Renaissance classical motifs in English architecture with the introduction of Protestantism to England in the sixteenth century under Henry VIII. Classicism in English architecture was at its zenith in the early nineteenth century and this coincided, according to Pugin, with a peak in social problems. He therefore saw an association of Protestantism, Classicism, and social problems as being in opposition to an association of Catholicism, Gothic, and good society. In Pugin's romantic equation a return to the Gothic manner of

PHOTOGRAPHY BY MALCOLM THURLBY

*Malcolm Thurlby is a professor of art history at York University, Toronto*

## MEDIEVAL TORONTO

*Nineteenth-century  
Toronto was a New  
World city with  
a medieval bent*

MALCOLM THURLBY



A detail of the south portal of St. James' Anglican Cathedral (top), whose design was inspired by the north portal of the west front of Wells Cathedral (bottom).



**Fred  
Cumberland's  
design of St.  
James' Anglican  
Cathedral  
complied with  
the nineteenth-  
century beliefs  
that Gothic  
represented  
true Catholic  
Christianity and  
that Anglicans  
should return to  
High Church  
ideals**

The polygonal apse of  
St. James' Anglican Cathedral  
(top) with large traceried  
windows and stepped  
buttresses is a reduced  
version of Lichfield Cathedral's  
Lady Chapel (bottom).





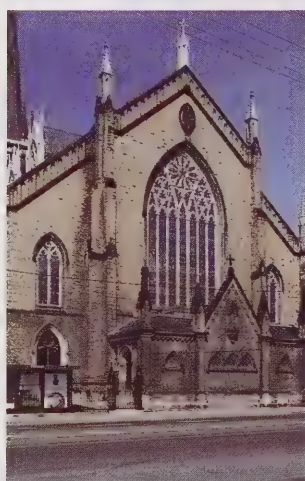
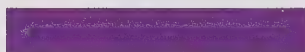


The interior of St. James' Anglican Cathedral, Toronto (left). The design of the exterior of the nave of St. James' Anglican Cathedral (top) was inspired by the nave of Salisbury Cathedral (bottom).



**Ironically William Thomas, the architect of the Catholic St. Michael's Cathedral, was less thoroughgoing in his application of Gothic style than Cumberland had been with St. James' Anglican Cathedral**

The east exterior of St. Michael's Cathedral, Toronto (top), is like the east front of Ripon Cathedral (bottom) in England.



building would bring a return to the Christian social values of the Middle Ages.

Paralleling Pugin's Catholic revival, the Oxford Movement (1833-1845) aimed at restoring High Church ideals for Anglicans. These reforms found liturgical and architectural expression through the Cambridge Camden Society, renamed the Ecclesiological Society in 1839. Like Pugin, the Ecclesiologists promoted the revival of medieval church design, with the ideal models being found in the late thirteenth- and early fourteenth-century Middle Pointed style, now more generally known as Decorated. Their views were expressed in pamphlets such as *A Few Words to Church Builders* and, between 1841 and 1868, in a quarterly journal entitled *The Ecclesiologist*.

Initially the Ecclesiologists' recommendations were rather restrictive, suggesting that design should be confined solely to medieval models. However, such recommendations were not entirely realistic for a Victorian urban setting. On the one hand, the rural Gothic parish church lacked the monumentality necessary to rise above nearby commercial structures. On the other, the recreation of the great medieval cathedral would have proved impractical in terms of both availability of land and cost. By the late 1840s architects in England used their Gothic models more inventively with a view to creating a suitable design for the Town Church.

Fred Cumberland's design for St. James' Anglican Cathedral belongs to this very phase of Victorian Gothic. Virtually every aspect of the design finds precedent in English Gothic cathedrals, but their combination is Cumberland's. The deeply undercut mouldings of the main south entrance arch, which are carried on detached columns with rich "stiff leaf" foliage carved on the chalice-shaped capitals, reflect thirteenth-century models, like the north portal of the west front of Wells Cathedral. The polygonal apse with large traceried windows and stepped buttresses is a reduced version of Lichfield Cathedral's Lady Chapel. The exterior elevation of the nave is inspired by Salisbury Cathedral.

The windows of the nave and sanctuary at St. James reflect Cumberland's profound understanding of medieval design principles. Medieval architects often expressed the division between the nave and the sanctuary by the richer decoration and



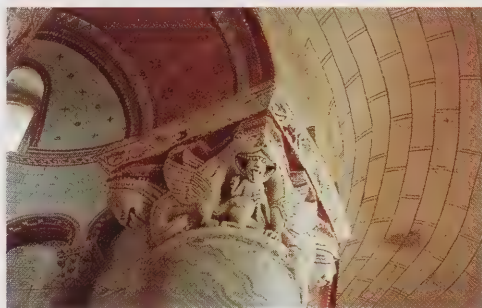
articulation of the latter, in order to make it appropriate for the location of the high altar. For example, at St. James' the simpler Early English lancets of the nave contrast with the more elaborate Decorated traceried windows of the sanctuary. It is also significant that the nave and aisles are wood-roofed, whereas the sanctuary is covered with an elaborate ribbed vault. The vaulted sanctuary ultimately derives from the ciborium or baldochino—a canopy supported on four columns over the high altar—that became integrated architecturally as a high ribbed vault in the Romanesque cathedral of Durham after 1093. Subsequently the high ribbed vault became a common feature in major English Romanesque churches and the norm for Gothic cathedrals.

The exposure of the wooden roofs of the nave and aisles also represents an important tenet of Gothic revival architectural principles as propounded by Pugin and the Ecclesiologists: materials should not masquerade as something other than themselves. Wood should appear as wood and not be plastered and/or painted to appear as stone. There was a particular dislike for lath-and-plaster vaults, and therefore Cumberland's sanctuary vault at St. James' may well have been frowned upon by Gothic purists. It may be noted, however, that a lath-and-plaster vault was used by Pugin in the chapel of Loretto Abbey at Rathfarnham, near Dublin, and such vaults continued in use in churches designed by his son, Edward Welby Pugin. On the exterior of St. James' the exposure of the brickwork represents a great change from the 1831 church in which the brickwork was plastered and scored in imitation of cut-stone masonry.

The Anglicans of Toronto were not alone in their building of a new Gothic cathedral. In 1845 the Catholics of the city commissioned William Thomas to build St. Michael's Cathedral. Thomas was less thoroughgoing in his application of Gothic practice than Cumberland. For instance, the main arcade piers in St. Michael's are of wood, made to imitate stone. Nevertheless, he revealed a remarkable sensitivity towards certain Gothic details. But it is in the east front that Thomas displayed his knowledge of English cathedral design; the sheer, cliff-like facade and the seven-light traceried window are like the east front of Ripon Cathedral. Thomas's love of things Gothic is further attested in his own residence, Oakham House (1848), at the southwest corner of Church and Gould streets.

The monumentality of St. James' and St. Michael's cathedrals was not matched in other Toronto churches until the 1870s with the construction of Metropolitan Methodist (1870-1873) and Jarvis Street Baptist (1874-1875), both by Henry Langley. Indeed, the Anglicans were often intent on recreating the image of the small, rural English parish church in the New World. Comparison of a contemporary engraving of St. Peter's on Carlton Street in Toronto with the thirteenth-century St. Michael's, Long Stanton, located to the north of Cambridge, England, and a favourite church of the Ecclesiologists, provides a case in point. How different the Toronto church appears today engulfed in urban sprawl and dwarfed by an apartment block to the north. In contrast, the romantic image of the recreated medieval past may still be experienced with the cemetery church of St. James the Less on Parliament Street.

In the late nineteenth century Toronto's medieval revival Protestant church architecture saw an important development for which there was no direct model from the Middle Ages. The lon-

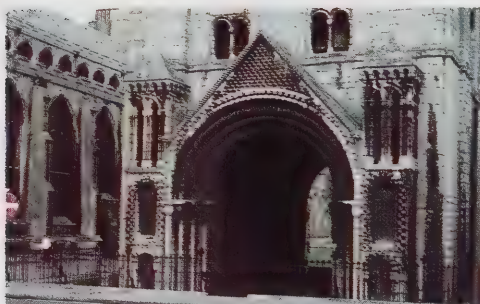


The motif of birds pecking a head on a capital in the atrium of University College, University of Toronto (top), is much like the motif of dragons devouring a man found on a capital at St. Pierre at Chauvigny (Vienne), France (middle). (Bottom) Details of the capitals of the south entrance of Toronto's Old City Hall.



**Along  
with Gothic  
architecture,  
Romanesque  
buildings served  
as an important  
source for  
the Victorian  
architect**

The design of the main entrance to University College, University of Toronto (top), is based on the gatehouse of Bury St. Edmunds (Suffolk) Abbey (bottom).



gitudinal axis of the medieval basilican plan, as found in St. James' Anglican Cathedral, was not well-suited to Protestant worship with its emphasis on the word preached from the pulpit. At the same time Protestant congregations required ancillary space for several purposes, including the Sunday school. In Toronto an ingenious matching of Gothic design principles with the requirements of Protestant worship and schooling was achieved by Henry Langley in Jarvis Street Baptist Church.

In the Baptist church, the long nave of the cathedral is replaced by a nearly square sanctuary with seating arranged amphitheatrically around the pulpit platform. The polygonal sanctuary space of the cathedral has been expanded to house the church offices, lecture rooms, and classrooms. All this was achieved in keeping with the Gothic design principle of externally articulating the separate internal spaces. Finally the tower, which on the cathedral is placed centrally on the facade, is set diagonally on the southwest angle of the Baptist church so as to be equally prominent along both Jarvis and Carlton streets.

Along with Gothic architecture, Romanesque buildings served as an important source for the Victorian architect. Toronto boasts some particularly fine examples of revived Romanesque detailing, not the least of which are found on the campus of the University of Toronto.

The essential massing of Cumberland and Storm's University College is based on the Gothic revival design for the Oxford Museum by Deane and Woodward (1855). However, instead of adopting the Gothic detailing of the Oxford Museum, Cumberland and Storm applied Romanesque motifs. The design of the main entrance portal is based on the gatehouse of Bury St. Edmunds Abbey with the multi-ordered, round-headed arch set beneath a richly textured gable and flanked by arcaded turrets with pyramidal roofs. From an East Anglian source come the so-called cushion bases of the arcade of the entrance cloister to the chemistry laboratory, which are characterized by plain semi-circular faces like those in the nave clerestory at Norwich Cathedral. Throughout University College, the differentiation of ornamental details captures the important principle that variety was the spice of life in Romanesque decoration. Furthermore, the symmetrical disposition



of the motifs on the capitals of the atrium follows the Romanesque concept of using ornament to emphasize the main lines of the capital thereby creating truly architectural sculpture.

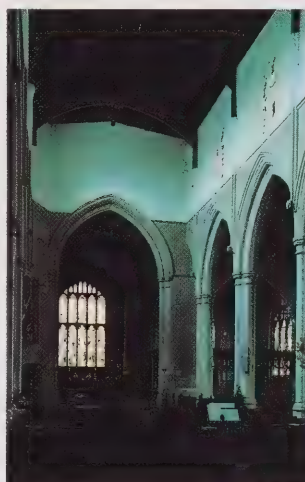
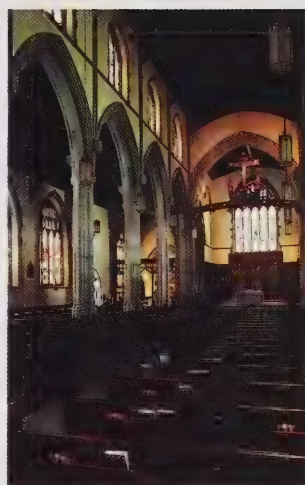
On the east side of Kings College Circle the entrance portal to the University of Toronto Library, created by David B. Dick (1891), is also based on a British Romanesque model of the north transept entrance of Kelso Abbey (Roxboroughshire).

The Romanesque style in North American architecture was enhanced through the practice of the American architect Henry Hobson Richardson (1838-1888). Richardson, who received part of his training at the Ecole-des-Beaux-Arts in Paris, made a detailed study of French Romanesque architecture, and this served as the basis for the creation of the Richardsonian Romanesque style. His works, such as Trinity Church in Boston (1873-1877), had an immense influence on church design, and this is certainly true for such Langley and Burke churches as Trinity St. Paul's United (formerly Trinity Methodist) on Bloor Street West at Robert Street (1889). More specifically, the Allegheny County Court House and Jail in Pittsburgh (1884-1899) was the very model for E. J. Lennox's Toronto City Hall (1889-1899). Just like Richardson, Lennox managed to capture the spirit of the Romanesque without resorting to blind copying of specific models. An awesome monumentality is achieved in the city hall through the use of massive hammer-dressed stonework and the low, heavy proportions of the round-headed entrance arches. In the detailing of the capitals the true spirit of the Romanesque is recreated in the caricatures carved within the foliage scrolls.

There is another special characteristic of the English Gothic that is apparent in some nineteenth-century North American buildings. In the 1890s Chicago architects realized just how appropriate repetitive Perpendicular (fourteenth- to sixteenth-century English Gothic) motifs could be for the articulation of skyscrapers. This is well illustrated in D. H. Burnham and Company's Fisher Building (1896), and the style was later applied in Toronto to Burke, Horwood and White's Wesley Building (1913), now the CHUM/City Building located at 295 Queen Street West. More traditional applications of the Perpendicular style in the twentieth century can be seen elsewhere in Toronto. The Soldiers' Tower (Sproatt and Rolph, completed 1924) at the west end of Hart House incorporates an exquisite fan vault, of which the earliest extant example is in the cloister of Gloucester Cathedral (begun c. 1364).

The medieval revival continued in Toronto into the twentieth century with more than the Perpendicular style. Arthur Holmes's Holy Rosary Catholic church on St. Clair Avenue West, completed in 1926, represents a return to the very principles set forth by Pugin ninety years earlier. Holmes took the fifteenth-century parish church of St. Mary at St. Neots (Huntingdonshire) as his model and carefully reproduced the details of the nave arcades, the clerestory and the aisle windows.

The buildings discussed in this article represent but a fraction of the medieval references to be found in Toronto architecture. They illustrate the richness of the architectural heritage of the city and the importance of preserving it. ♡



Holy Rosary Roman Catholic Church, Toronto (top), which was built in the twentieth century, was modelled after the fifteenth-century parish church of St. Mary at St. Neots (Huntingdonshire), England.

*The Twelfth Annual Canadian Conference of Medieval Art Historians will be held in the Lecture Room of the McLaughlin Planetarium on 6 and 7 March 1992. For further information call (416) 586-5797.*

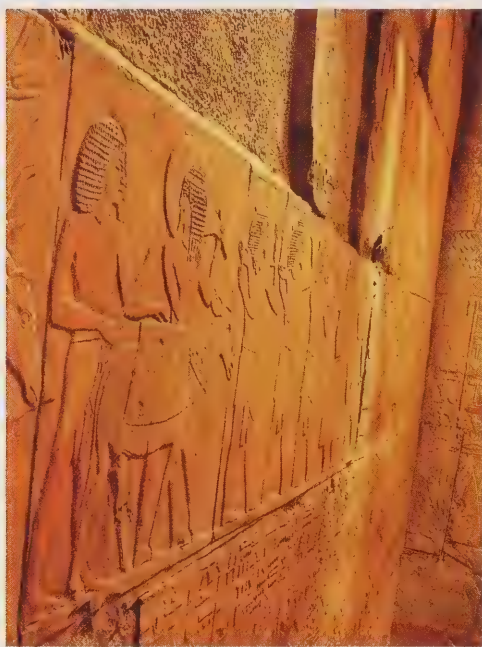


## THE ROM'S NEW ANCIENT EGYPT AND NUBIA GALLERIES

*The ROM presents  
permanent galleries that take  
a fresh look at ancient cultures*

SANDRA SHAUL

PHOTOGRAPHY BY EDWARD GAJDEL



**Above:** A view of the Punt wall in the Ancient Egypt Gallery. The wall is a cast of a wall mural from the mortuary temple of Queen Hatshepsut. **Facing page:** Looking through an Egyptian case to the Nubia Gallery.

IN A RECENT PROMOTION FOR THE ROYAL Ontario Museum, an image of a mummy is accompanied by the exhortation "Get an afterlife." The promotion was clearly an amusing invitation to the public to pay a visit to the Museum and a reminder that the Ancient Egypt and Nubia Galleries were opening on 23 January. Ironically, after visiting the new galleries, I found that there was less play-on-words and more truth to the slogan than its author ever intended. The galleries not only give a new kind of life to cultures and societies that died centuries ago, they show that the Museum is a vital and evolving institution even when its focus is on the past.

Getting an afterlife seems to have been the major concern of ancient Egyptians. Like other traditional museum galleries, the ROM's Ancient Egypt Gallery displays objects that came mostly from graves, tombs, and temples. However, what becomes most evident at the ROM is that what is popularly construed

as the ancient Egyptians' obsession with death is, in fact, the great value they placed on life, first on Earth and then in the next world. The preservation of the earthly body through mummification, the burial of earthly goods or reproductions of them, the construction of tombs for storage and protection, and scripts that described life on Earth and the passage to the spiritual world, were the means necessary for a person to record and continue, into the spiritual domain, the life that began on Earth.

Ancient Egypt is much more than mummies and pyramids and the dramatic stories of their discoveries over the past two centuries. Through its design and displays of 1650 original and reconstituted artifacts and models in 585 square metres (6500 square feet), the Ancient Egypt Gallery recounts the much more complex and intriguing political, economic, cultural, and social histories of a civilization that endured for more than 4000 years.

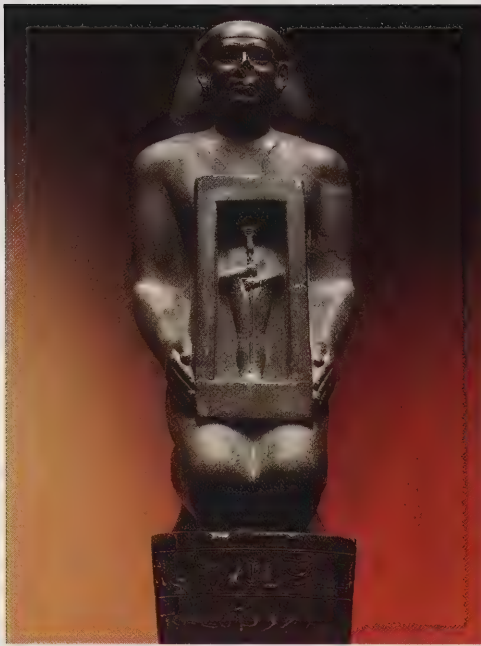
As you enter the Ancient Egypt Gallery, you are welcomed by displays that are designed to evoke the colours and textures of Egyptian architecture and landscape. Under the guidance of ROM Egyptologist and Nubologist, Dr. Nicholas Millet, the Museum designers collaborated with Reich and Petch architects to organize the gallery around a huge wall, which cuts through its centre. Along this wall, Egyptian history is chronicled through a number of displays. Historical periods are divided by portals and colonnades that extend from or surround the wall. Thematic displays detailing various aspects of daily life—from tools to food vessels, partially completed works of art, weapons, jewellery, clothing, and cosmetics—are arranged around the perimeter of the gallery, and exhibits on Egyptian religion are located opposite the apex of the large history wall.

*Sandra Shaul is executive editor of Rotunda magazine*









**Top:** A statue of the Egyptian royal scribe Bokennef, Saqqara, c. 500 B.C. The scribe is shown presenting an image of the god Ptah to the temple. The dedication, written in hieroglyphics, is by Bokennef.

**Middle:** An alabaster bowl dates from 3100-2686 B.C., the Archaic period of Egyptian civilization.

**Bottom:** Egyptian tomb figures depicting the birth of a calf date from about 2000 B.C.



One of the problems faced by Museum curators and the designers and architects was how to expand the interests and knowledge of dedicated “mummyphiles” visiting the gallery. The solution was to place the mummies within the religion exhibits, located halfway through the gallery, so that visitors have an opportunity to be attracted to other things.

Not one of the people that I have taken through the gallery—the youngest were eight and ten years old—failed to be moved by the Predynastic burial displayed at the entrance of the gallery. The body, resting in a fetal position, surrounded by modest ceramic food containers and a weaver’s tool, had been naturally mummified when it was simply buried in the desert sands between five and six thousand years ago. What an extraordinary contrast to the great Pharaonic burials and tombs that would appear about 2000 years later, and what an extraordinary

connection.

There are also many images that connect the ancient Egyptians to people living today. In a Predynastic display case there are two figures easily recognizable as wailing women, and another female figure, created about 5500 years ago, that displays tattoos that are still customary in North Africa. In a nearby case, ceramic vessels and stoneware dating from the Archaic period (3100 to 2686 B.C.) not only illustrate class distinctions, but show the influence of Mesopotamia.

In the daily life displays tomb figurines depicting such common scenes as a cow giving birth to a calf provide further links to the present. Alabaster bowls in both the history and daily life cases show the masterful skills of their creators and tastes in design identical to our own. Excellent video displays about hieroglyphs and speculation about the way in which the Great Pyramid of Giza was built are tributes to the intellect and ingenuity of these people.

Popular notions about ancient Egyptian civilization that make its people seem so remote from us are really dispelled from the moment visitors enter the gallery. When visitors do arrive at the religion displays, the mummy of Anjau finally loses the aura of being a fascinating dead thing missing several toes on one foot. He becomes equally compelling as the remains of a human being who may have been a wealthy landowner or trader, who faced the problems and felt the emotions common to us all, and who was buried in a manner that preserved his body as an earthly home for his soul to visit and, inadvertently, as a record for us 2500 years later.

Of course there is no question that the complex religious beliefs and customs of the Egyptians are fascinating as is the unique art that was produced to express the worship of Osiris, king of the dead and symbol of immortality. The god is best displayed on the mummy case of Djed-



Maat-es-ankh, a female musician in the temple of Amun-Re in Thebes.

The religion section also contains canopic jars created to hold bodily organs, finely painted mummy masks, mummified sacred animals, and shawabties, magical figures placed in the tombs to work in the fields of paradise in place of the deceased. Papyrus fragments from the *Book of the Dead*, or as the Egyptians called it, the *Book of Coming Forth in the Daytime*, contain passages from the collection of spells buried with the deceased to help the person pass the judgement of Osiris. Many objects buried with the dead often relate to food because all the sacred materials would have been useless if the deceased did not have sustenance.

The second half of the Ancient Egypt Gallery contains objects from what I consider the most compelling historical period, the New Kingdom (1567 to 1085 B.C.). A floor map and a large cast of a relief of the pharaoh, Thutmose III, the empire builder who extended the Egyptian empire to the Euphrates, introduce the period. During the middle years (1379 to 1362 B.C.), known as the Amarna Period, Akhenaten ruled. His reign was characterized by a wealth of economic and intellectual exchange with other cultures, which is apparent in the striking artifacts on display. With his wife, the legendary beauty Nefertity, Akhenaten experimented with monotheism.

Like the cast of Thutmose III, a cast of a wall mural from the mortuary temple of the great Queen Hatshepsut was made in 1905 by Charles Trick Currelly, one of the founders of the ROM. Over the decades, the originals have faded, and so the casts provide an enduring record of how the reliefs once appeared. The mural depicts a voyage to Punt (possibly modern Somalia) by an Egyptian expedition on behalf of the Queen. Audio units located in front of the wall describe the incredible discoveries made by the Egyptians. After her death, Thutmose III, Hatshepsut's resentful heir, nephew, and son-in-law, defaced the Queen's image.

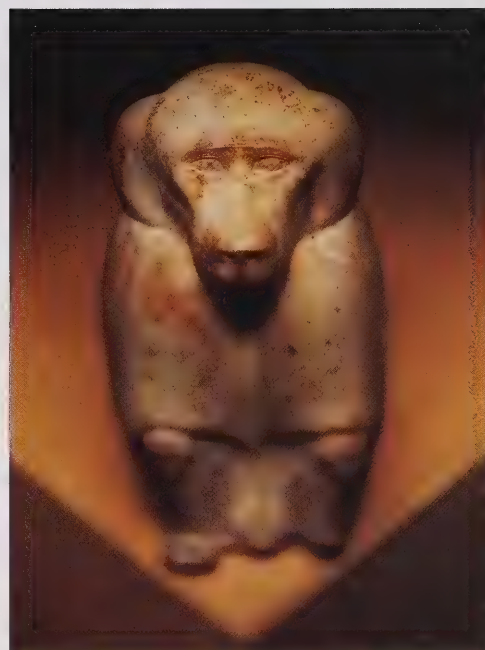
In the Late Period (1085 B.C. to A.D. 324), Egypt was continuously invaded by Libyans, Nubians, Assyrians, Persians, Macedonians, and Romans. Art of the time shows a mixture of foreign influence and Egyptian classical style. After leaving the Ancient Egypt and Nubia Galleries, visitors can get a fuller sense of the look of Roman Egypt in the adjacent Roman galleries.

From Ancient Egypt visitors proceed to the Nubia Gallery, which expresses a different sense of afterlife. Research on Nubia, the region that covers what is now southern Egypt and northern Sudan, really began in earnest in the 1960s during the construction of the Aswan High Dam. It was apparent that the dam would flood the land that held the relics of the region's past, thereby permanently burying all evidence of several an-

**Top:** Baboon, limestone, Saqqara, 378-341 B.C. The baboon represents Thoth, the Egyptian god of knowledge and science.

**Middle:** Gold-handled flint knife, c. 3000 B.C. The ceremonial butcher's knife is marked with the name of the Egyptian King Djer.

**Bottom:** Scarab, c. 710 B.C., commemorates the Kushite victory of King Shabako, ruler of the united kingdoms of Egypt and Nubia, over the inhabitants of the Negev desert.









cient cultures. In response, UNESCO brought together a multinational archaeological corps to retrieve as much as possible.

Nick Millet was director of the American Research Center in Egypt at the time. After beginning work at the ROM in 1970, he arranged for the acquisition of many Nubian objects, which are the foundation of the current collection. The task of bringing to light and new life the ancient peoples of Nubia falls to scholars such as Millet and Krzysztof Grzymski, a specialist in Sudan and Nubian archaeology who has been with the Museum since 1984. One way in which Millet and Grzymski have carried out this duty is through the creation of the ROM's Nubia Gallery, the first in North America. The gallery covers 117 square metres (1300 square feet) and displays 350 objects.

Nubia, which was first settled around the same time as Egypt, differs in that it has been home to a number of diverse cultures that have ruled at various times. Whereas the very well-defined ancient Egyptian culture eventually died out, Nubian culture still flourishes today in an Islamic society.

The Nubia Gallery documents, in chronological order, what is known of each culture through its artifacts. To the visitor standing in the centre of the gallery, the various cultures distinguish themselves through their distinct styles of writing, ceramics, clothing, tools, weapons, and architecture. However, beyond this material evidence of each culture's existence there is much to be learned. For example, Meroitic script, which was developed around 300 to 200 B.C., during the time of the Meroitic Kingdom, is Africa's oldest writing system after Egyptian hieroglyphs. Unfortunately, the key to its interpretation has not been discovered. In 1963, Dr. Millet found the Adda stone, on display in the gallery, which shows decipherable Egyptian writing for the Meroitic text, but not enough of the Meroitic writing survived for translation.

Much of the Nubia Gallery traces the long relationship between Nubia and Egypt, its neighbour to the north. Egypt ruled Nubia from 1570 to 1080 B.C. Egypt also extended its empire east into the Sinai. If the interpretation of the Punt wall is correct, trade extended from Egypt to present-day Somalia. In the eighth century B.C., Nubian kings in turn conquered Egypt and ruled for about 75 years. More foreign conquests of Egypt extended the cross-cultural influences west through Africa and north to Rome.

The Ancient Egypt and Nubia Galleries expand the imaginations of visitors beyond the glamour of King Tut to a much broader vision of ancient Egypt, and introduce Nubia, a civilization whose ancient roots still sustain strong indigenous traditions. But in keeping with the "mankind discovering" theme of all the new ROM galleries, they also intimate what still must be learned. ♡

**Facing page:** The mummy of Anjau in the religion section of the Ancient Egypt Gallery.  
**Right:** A column base made of faience from a building in the Nubian city of Meroe, dating A.D. 150.  
**Below:** An Egyptian New Kingdom vase, dating 1567-1085 B.C.





**Green tourmaline  
from Governador Valadares,  
Minas Gerais,  
in the collection of  
the Royal Ontario Museum.**





THE HELMET LAMPS FOCUS ON A SMALL PATCH OF ROCK. THE MINE IS DIMLY lit, but under the concentrated glare of the lamps the normally greyish rock gleams with flecks of purple lepidolite mica. A hammer strikes at the centre of the circle of light. Flakes of sparkling rock and reddish-brown mud tumble to the floor. The mud looks rather drab, surrounded by the glitter of the mica, but the smiling faces of the miners say something else. This is pay dirt.

The mud comes from a football-shaped hollow in the rock about 50 centimetres long and 30 centimetres across. It doesn't look like much to the novice, but this is a gem pocket. Embedded in the mud are about two dozen tourmaline crystals, some as small as match-sticks, a couple as large as a human thumb. It's hard to tell the quality of the crystals; they're smeared with mud and coated with a rusty scale.

After cleaning, two of the crystals are found to have large transparent gemmy areas. The others are well formed, with good colour: pink in the middle of the crystals with a green tinge on the ends. These will be sold for carving or to be made into beads. A few of the more aesthetic specimens will be sold to mineral collectors. All in all, it's a good day's work at the Himalaya Tourmaline Mine.

Tourmaline may not have the romantic aura of diamonds, emeralds, or rubies, but it is one of the leading money-makers in the coloured-gemstone market. Terri Ottaway of the ROM's Department of Mineralogy explains, "First of all, tourmalines come in just about any imaginable colour, and large stones are not uncommon." For example, there is red elbaite, which has the gem name rubellite; blue to bluish-purple tourmaline, which is called indicolite; and colourless tourmaline, which is called achroite. Many in fact have several colours together in the same stone. A tourmaline gem that grades in colour from one end to the other, usually green to pink, is called a bi-colour tourmaline. Slices of such a stone, set in jewellery with the pink on the inside and the green on the outside, are called "watermelon" tourmalines. Ottaway comments, "Secondly, tourmaline is fairly durable. Diamonds are hard, but can cleave if you hit them the wrong way, and emeralds are brittle and easily chipped. Last but not least is price. They're not cheap, but you can buy a high-quality tourmaline for a fraction of the cost of better known gems."

The Himalaya Mine is about 100 kilometres northeast of San Diego. Eighteen kilometres to the north is Mount Palomar, where astronomers use giant telescopes to probe the secrets of the universe. At the mine, men tunnel into solid rock, seeking the riches within.

The tunnels follow a special type of rock known as a pegmatite. Almost all gem-quality tourmaline crystals come from pockets or cavities in pegmatites. Indeed, pegmatites contain the greatest variety and abundance of gem material of all rock types found at the Earth's surface.

The birth of a gem pocket begins far beneath the surface of the Earth with a mass of molten rock called magma. The magma rises through the Earth's crust, but begins to cool and solidify before it can erupt as a volcano. The solidification happens in stages, with the miner-

*Their durability,*

THE

*rainbow colours, and*

TOURMALINE

*amazing properties*

AFFORDABLE

*make tourmalines*

*popular gems*

GEM

JOHN KENNY

PHOTOGRAPHY DEPT., ROM

*John Kenny is a Toronto freelance writer*



## TOURMALINE FACTS

The name tourmaline refers to a group of 10 mineral species with related chemical compositions and similar crystal structures. Tourmaline's basic structure is composed of boron, silicon, and oxygen, making it a borosilicate. Fitted within the structure are atoms of various metallic elements. In the case of elbaite, the most common gem form of tourmaline, atoms of sodium, lithium, and aluminium are present in the crystal, giving the rather imposing formula of  $\text{Na}(\text{Al,Li})_3\text{Al}_6(\text{BO}_3)_3\text{Si}_6\text{O}_{18}(\text{OH})_4$ . It's the most complex of all major gemstones.

The structure of tourmaline allows it to include many other atoms in trace amounts. Well over half the elements in the periodic table have been found in tourmaline, giving it a reputation as something of a catchall mineral. It is this ability to incorporate other atoms, though, that gives tourmaline its incredible variety of colours.

als that have the highest melting temperatures crystallizing first. Much of the magma solidifies as granite. The remaining magma becomes enriched with abundant elements such as silica and aluminium, less abundant elements such as beryllium, volatile elements such as lithium and boron, and a significant amount of water.

At this point pressure causes the remaining molten material to be injected into cracks and fissures in the surrounding rock. The resulting veins can range from metres to several kilometres in length. These veins are the pegmatite.

The pegmatite continues to cool and large coarse crystals form. Once again the volatile and rare elements are left out of the new crystals and are further concentrated. As the temperature falls below 500°C, the last of the magma solidifies, leaving behind trapped pockets of mineral-rich water. The stage is now set for these pockets to become gem pockets.

As the temperature continues to fall, lepidolite, quartz, feldspar, beryl, topaz, and other minerals crystallize, and boron and lithium combine with aluminium and silica to form crystals of tourmaline. In the open spaces of the pocket the crystals are able to grow unimpeded. This is critical for the formation of gem-quality crystals. Clay often fills the rest of the pocket.

Crystallization stops once the temperature falls below 250°C, but one more key step remains. The remaining watery solution is often highly corrosive. If this corrosive solution is not able to leak away, it might completely dissolve the tourmaline crystals, leaving behind nothing but mica and clay. If, however, it does escape through cracks in the rock, the tourmaline crystals will survive.

Gem-bearing pegmatites generally form at shallow depths in the Earth's crust. Shallow to a geologist, that is: not more than 3.5 kilometres deep. Below that depth the pressure from the overlying rock is too great for the formation of open pockets. Geological processes of mountain building and erosion may bring these "shallow" pegmatite bodies close enough to the surface to be discovered and mined. It is estimated that less than one per cent of all pegmatites contain pockets. Of these, only a fraction has the right combination of elements, in sufficient abundance, to form gems.

In Southern California the conditions were just right. San Diego County contains several gem pegmatites of which the Himalaya is the most famous and the most productive. Local Indians were the first to discover the site. Tourmaline crystals, which had eroded from areas where the pegmatite reached the surface, were sometimes used as burial offerings.

Mining began in earnest in 1898. Most of the production was shipped to China. There, tourmaline carvings and necklaces of tourmaline and jade were popular with the aristocracy. Red tourmaline buttons were also popular status symbols with members of the Mandarin class. The revolution in 1912 caused a crash in the tourmaline market, however, and as a result the mines were abandoned.

Serious mining resumed at the Himalaya Mine in the 1960s and today it is North America's leading producer of gem tourmaline. Images of a huge industrial operation like those of the diamond mines of South Africa may come to mind, but there is no similarity. Only seven men work the Himalaya deposit. Like most gem mining the world over, the entire enterprise is made up of a handful of men, a small plot of land, and the dream of hitting the mother lode.

"It's a treasure hunt," says Bill Larson, one of the owners of the Himalaya Mine. Larson and his partners have been working the property for thirteen years. In that time, he estimates, they have recovered three to four tonnes of tourmaline. It may sound like a lot, but of that total only



one per cent or 30 to 40 kilograms is fine gem-quality material.

Operating a small mine is an expensive business, claims Larson. "Just bringing the mine up to modern standards damn near broke us." The mining regulations in the United States and Canada are written for the mining giants, not the small operator, he notes, echoing the complaints of small businessmen in many fields. "What keeps you going is hope," he says, "hope, and the thrill when you actually do hit a pocket."

That hope paid off in spades in May 1989 when they hit a winding pocket 4.2 metres long and about half a metre in diameter. In the course of the week it took to clean out the pocket, they extracted over 500 kilograms of tourmaline.

Still, it's a break-even operation, says Larson, noting that the total production for the first three quarters of 1991 amounted to just under 100 kilograms. Production at the Himalaya Mine accounts for only 10 per cent of Larson's business in the gem and mineral trade. Much of the rest comes from Brazilian gem deposits. Why does he keep the mine operating?

"It's kind of a hobby." The words are nonchalant but the tone of voice indicates something more. Later in the interview the truth comes bubbling out. "It's a real thrill when you hit a pocket. You reach into the clay and you can feel the crystals. Some of them are so sharp they cut your fingers, but you don't care. It's such a rush!" They call it gold fever, but it applies to more than just the yellow metal. It affects anyone who has tasted the exhilaration of discovering treasures buried in the Earth.

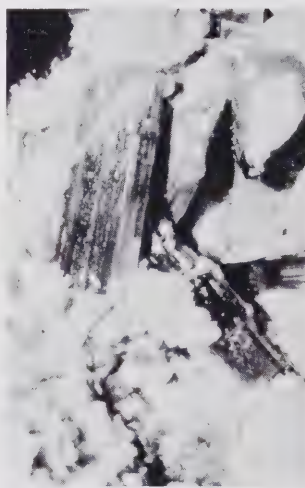
Some 10,000 kilometres southeast, in the Brazilian state of Minas Gerais, that same fever is also at work. This area, north of Rio de Janeiro, is a fantastic complex of gem-rich pegmatites, covering some 230,000 square kilometres. Minas Gerais is the world's leading producer of gem-quality tourmaline, topaz, and aquamarine. More exotic gems such as kunzite (the lilac-coloured variety of spodumene) and alexandrite (the colour-change variety of chrysoberyl) are also found there. Until recently, most of the tourmaline and other gem production was done by *garimpeiros*, or independent miners. Keith Proctor is an American gem dealer who has travelled extensively through Minas Gerais, visiting the mines and talking with the *garimpeiros*. "Very few of them are professional miners, they're mostly just peasant farmers," Proctor explains. "When word of a find leaks out, thousands of them will arrive in a few days. Then a few months later they'll move on to another spot."

The story of the Santa Rosa mine is typical. In October 1967 *garimpeiro* Tiao Matias found a deposit of gemmy pink-and-green bi-coloured tourmalines in an abandoned mica mine. Matias tried to keep the find a secret, but word leaked out. Within a few weeks more than 4000 *garimpeiros* moved in, hacking away at the pegmatite. The first year yielded about 500 kilograms of clean multi-coloured tourmaline. But production began to decline, and the *garimpeiros* drifted off to greener pastures. After three years the mine was virtually abandoned.

In a land of desperate poverty, the lure of sudden riches is powerful. "Very few of them ever get rich. When I see the conditions that they put up with, I am amazed that any of them stick it out," says Proctor.

Today a variety of economic factors is slowly reducing the number of *garimpeiros*. "It's mostly the bigger operations that are still producing," says Rob Belcher, a Banff gem and mineral dealer who travels to Brazil twice a year. "You see it on the streets of Governador Valadares. Before there would be a fellow on every corner with a leather bag of goodies. Now there are only a few."

**Tourmaline crystals lying in a gem pocket.**



COURTESY GEMOLOGICAL INSTITUTE OF AMERICA



The combination of poverty and wealth also breeds violence. While more subdued than in the infamous emerald mines of Colombia, claim-jumping, murder, and gun-play are common. "It's a bit like the Wild West," says Belcher.

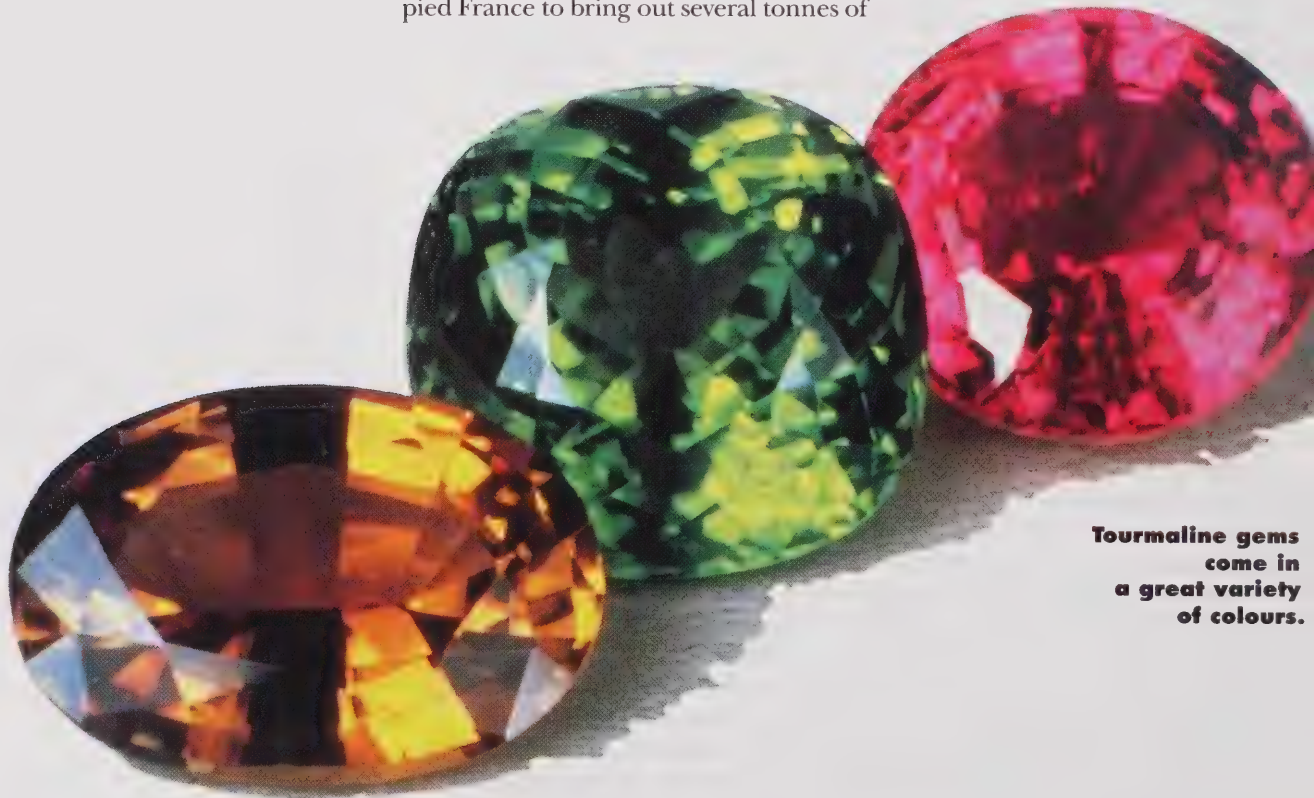
Portuguese explorers probing the Brazilian interior first found tourmaline in the late 1500s. Tourmaline, however, was not recognized as a distinct mineral species until the eighteenth century, so these gems came to be known as "Brazilian emeralds," or "Brazilian rubies." Much to the chagrin of mineralogists and serious gemmologists these names are still used by some jewellers today.

IT'S A REAL THRILL  
TO REACH INTO A POCKET  
AND FEEL THE CRYSTALS

The first western reference to tourmaline appears in the 1707 publication *Curiöse Speculationes bey Schlaf-losen Nächten* by Johann Schmidt. He wrote, "In the year 1703 the Dutch first brought a precious stone called tourmaline...to Holland from Ceylon, in the East Indies; it had the property of attracting ashes from warm or burning coals, as a magnet does iron, and also of repelling them again."

Magnetic gems? Not quite. What Schmidt was referring to was a property called pyroelectricity. When a crystal of tourmaline is heated it develops a positive electric charge at one end of the crystal and a negative charge at the other end. Conversely, when it is cooled the polarity is reversed. It is this static charge that earned tourmaline the nickname *aschen-trekker* meaning ash-drawer. Because of its pyroelectricity, tourmaline is rarely displayed in sunny jewellery store windows. The warmth of the sunlight causes a static charge that attracts dust to the jewel.

Tourmaline is also piezoelectric, meaning that it will develop an electric charge when subjected to mechanical stress such as compression. This property led to investigations of the possible applications of tourmaline in such items as submarine pressure gauges and sonar transducers, particularly during the war years. Indeed, in 1944 the need for tourmaline was felt to be so great that the U.S. Intelligence Service sent Martin Erhmann, a renowned mineral dealer, on a cloak-and-dagger mission into Nazi-occupied France to bring out several tonnes of



**Tourmaline gems  
come in  
a great variety  
of colours.**



Madagascar tourmaline. The mission evidently was a success.

Some of this material no doubt found its way to Los Alamos. Tourmaline gauges were developed to measure the blast pressure of the first atomic bomb tests in 1945. Tourmaline pressure gauges have been used at every American nuclear test since.

Today, quartz is more commonly used in piezoelectric applications, such as highly accurate watches and clocks. Synthetic quartz is easily and cheaply manufactured. However, tourmaline, because of its strength, resistance to chemical corrosion, and sensitivity, is still used in specialized applications.

The major uses of tourmaline are in the jewellery and decorative arts, and no serious mineral collector considers his or her collection complete without at least one showpiece tourmaline specimen. The Joninha specimen from Minas Gerais, Brazil, consisting of two red gem-quality crystals measuring 50 by 25 centimetres and 25 by 30 centimetres, is possibly the most expensive mineral specimen in the world.

Looking at the incredible variety of colours found in tourmaline gems and crystals, it's difficult to believe that they belong to the same mineral group. Trace amounts of iron and manganese are among the dozen or so elements responsible for the rainbow palette of colours. The zoning in multi-coloured crystals is the result of changing concentrations of the different elements that act as colouring agents in the crystals. The piezo- and pyroelectric properties of tourmaline may also play a role in colour zoning, with different elements being concentrated at one end of the crystal. Some tourmalines have different colours when viewed from different directions, a property known as pleochroism. A green stone may have a yellow tinge when viewed from another direction. Likewise blue stones may also have pink or purple hues.

The colour properties of tourmaline make it among the most beautiful of gemstones. It is found in many parts of the world besides California and Brazil, notably Maine, Madagascar, Mozambique, Namibia, Kenya, Tanzania, Sri Lanka, Afghanistan, Pakistan, and Nepal. The ROM has a collection of tourmaline both as cut gems and as natural crystals. It will be on display in the Perren Gem Room, scheduled to open in mid-1993 as one of the first phases of the new McLaughlin Earth Sciences Gallery. ♡

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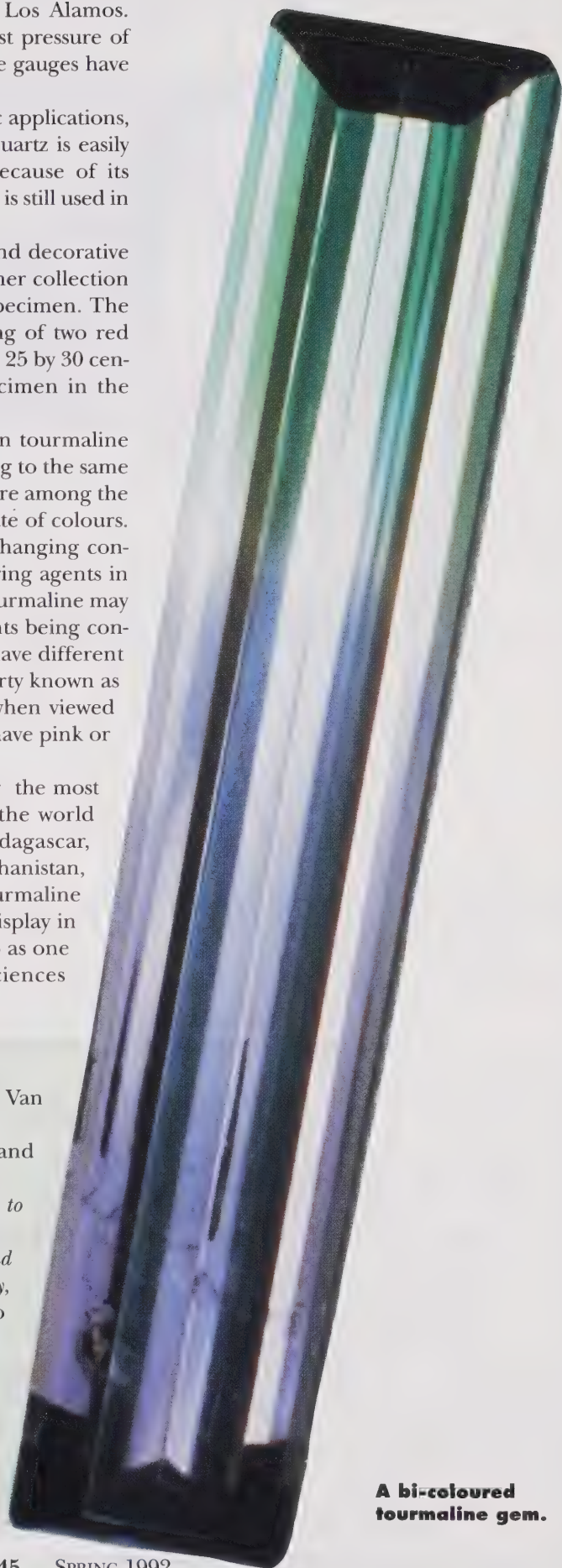
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**A bi-coloured  
tourmaline gem.**



*Kiev shares its splendour...*



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*The elegant former Bank of Montreal at Front and Yonge streets in Toronto is being transformed into the Hockey Hall of Fame.*

## Banking on Style

*The king was in his counting house,  
Counting out his money.  
The queen was in the parlour,  
Eating bread and honey.*

UNLIKELY AS IT SOUNDS, THE counting house was probably much more up-to-date than the queen's parlour. Although bankers and banks strike most people as the very models of conservatism, the buildings where we deposit our money and plan our financial destinies are often remarkably forward-looking pieces of architecture. Perhaps, as the architectural historian Patricia McHugh suggests, the fact that banks have very little visible product to offer means that they rely heavily on "image" and the latest fashion. Whatever the reason, banks are more sensitive indicators of architectural trends than our

houses, churches, or government buildings.

And it was ever thus, at least in Toronto. In 1827, when pigs and cows strolled the unpaved streets of muddy York, the Bank of Upper Canada erected an impressively fashionable building of cut limestone at 252 Adelaide Street East. Upper Canada's first chartered bank and the oldest building designed as a bank in Canada, this balanced neoclassical cube, perched on the edge of a primitive settlement, bespoke a self-confidence that bordered on the foolhardy. As it turned out, the bank failed in 1866, but not before adding a handsome Doric porch with curvaceous cast-iron railing in the 1840s.

Although the Bank of Upper Canada failed, the building on Adelaide Street survived to lead other

lives. (The bank and the other early nineteenth-century buildings on its block were rescued and restored in the 1970s by Sheldon and Judy Godfrey.)

Paradoxically, because of the reputation for stability necessarily cultivated by banks, bank buildings are most at risk when their companies are successful: the banks' desire to be up-to-the-minute has frequently led them to sacrifice older buildings for fashionable new ones.

A case in point is the jewel-box that the Bank of Montreal built in 1885-1886 at 30 Yonge Street. Behind this rococo beauty lies the ghost of another handsome, much more subtle bank that was demolished to make way for the new one. Built in 1845, the first Bank of Montreal on this site was a restrained Renaissance-revival building with living

PHOTO COURTESY BANK OF MONTREAL



quarters on the upper floors for the bank manager and his family. Forty years later fashion demanded something showier than this finely proportioned building with the air of a London club. For the new building the Toronto architects Frank Darling and Samuel Curry devised an almost manic sampler of classical motifs—Corinthian pilasters, pediments broken and whole, obelisks, cartouches, balustrades, shells, all manner of beautifully carved mouldings and trims, even a statue of Hermes, the god of commerce. Surprisingly, what sounds like a pile-up is actually a dashing piece of work that takes commanding possession of its corner site. All this elegance seems an incongruous home for the Hockey Hall of Fame, but that is the building's promised future.

In a time of robber barons and conspicuous consumption, the Bank of Montreal's classical borrowings suggested respectability, luxury, and mastery. By 1929, when the Canadian Bank of Commerce en-

gaged York & Sawyer, New York's premier firm of bank architects, to build them a bank and office tower at 25 King Street West, something more impressive was required. At 34 storeys and 475 feet (144.8 metres), the Bank of Commerce claimed to be the tallest building in the Empire, and the 32nd floor observation gallery was for the Depression-era tourist what the CN Tower is today. On paper, the design reads like an indigestible blend of modernity, tradition, and hubris—a base of neo-Romanesque solemnity, topped by an Art Deco office tower, topped again by an observation deck ringed with 24-foot-high (7.3-metres) carved totemic heads. And yet, what is now the Canadian Imperial Bank of Commerce is not only successful: parts of it, especially the limestone-clad bank at its base, are actually inspiring.

What humanizes the bank's immense scale and poignant plainness is a strategically placed series of bas-relief plaques. Some show ordinary beasts consorting amicably with fan-

tastical creatures; others depict Canadian industries. Still others comment almost humorously on our need for security: a man rests his head on a strongbox while a winged beast looks on sympathetically. Close observers of the carved bands surrounding the massive central door will discover symbols of thrift, industry, and fertility (squirrels, bees, wheat), while nearby a woman holds up a beehive and a Canadian coin. The not-to-be-missed interior is magnificently realized from the blue-gold-and-cream coffered and vaulted ceiling down to the bronze maple leaves on the doors of the Romanesque-style elevators. If banks are something of an emblem of our century, as cathedrals were for the Middle Ages and train stations for the nineteenth century, surely the Canadian Bank of Commerce is one of our proudest artifacts.

This "Romanesque skyscraper," as Margaret and Marilyn McKelvey call it in *Toronto: Carved in Stone*, was a major enterprise, but a small

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Toronto-Dominion branch of the same vintage demonstrates a similar desire to combine modernity and a Canadian idiom. Built in 1930, the streamlined rectangle at the corner of Yonge and Gerrard streets looks at first like many another Art Deco bank. But its architect, John Lyle, a prolific builder of branch banks, scorned the "endless copying of Grecian acanthus" and advocated an indigenous Canadian architecture. As a departure from stylized classical motifs, the columns here flower into Canadian produce, the medallions over the main entrance commemorate Canada's two founding nations, the bas-relief vases along the Gerrard Street side hold native flowers—riverbank gentian, trumpet creeper, and May-apple. As for the carved bands that surround the bank, Lyle chose Indian-inspired designs rather than classical bead-and-reel or egg-and-dart mouldings.

Superficially, the Toronto-Dominion Centre at 55 King Street West, built from 1964 to 1971 by one of the guiding lights of modernism, seems a far cry from the neoclassical symmetry of the 1827 Bank of Upper Canada. But look closely at what Patricia McHugh calls the "dark, austere beauty" of Mies van der Rohe's great complex of buildings and the classical bones that underlie modernist architecture become apparent—the symmetry, the repeating elements (in this case, steel beams rather than columns), the reliance on underlying form rather than ornamentation, the sparing use of detail that is finely finished but never fussy. Do these characteristics of modernist architecture not suggest qualities we would like to see in our bankers? And does it not seem suitable that the two modern buildings that have earned most acclaim for Toronto the Good are temples of commerce and government—the New City Hall and this banking complex?

The most successful post-Miesian Toronto banks have paid attention to the T-D Centre's examples of high-style gloss and careful detail, al-

though none has surpassed it. The Bank of Montreal's First Bank Tower at 50 King Street West is a pedestrian exercise in the less-is-more philosophy; Scotiabank's Scotia Plaza at 30 King Street West has red cladding and some stylish ideas but ultimately, like Stephen Leacock's knight, rides off in too many directions at once. The best of the newcomers is the Royal Bank Plaza at 200 Bay Street, built by Webb Zerafa Menkes Housden in the mid-seventies: its glittering, pleated glass towers tinted the colour of money are

the last word in stylish opulence.

Except that for banks, those tireless patrons of the new in architecture, there is no such thing as the last word. And when it comes to the next trend—deconstructionism, historicism, neo-classicism, or something completely different—look to your local counting houses. Luckily for the built environment, there's always a new one on the horizon.

KATHERINE ASHENBURG

*Katherine Ashenburg is art and books editor for The Globe and Mail*

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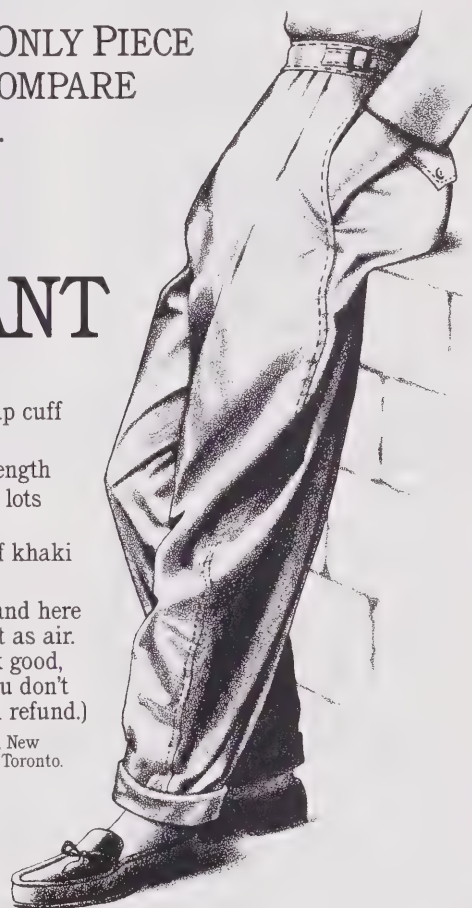
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## Calligraphy, Ecology, Elephants, and More

DESPITE THE PUNNING TITLE AND the dauntingly dry subtitle, Richard Curt Kraus's book **Brushes with Power: Modern Politics and the Chinese Art of Calligraphy** (University of California Press, US \$24.95) is a wonderful, wise, and fascinating piece of work. When necessary, it is even emotional. Early on, for example, the author demolishes various Western misconceptions about the nature of written Chinese. The most persistent of these is the notion that all the ideograms are basically pictographs—that just as the sign for *mountain* (*shan*) derives from a picture of a mountain, so must all the others have evolved from drawings of the things they represent. This was the view of people who should have known better, particularly Ezra Pound.

In re-editing and reviving a treatise by Ernest Fernollosa entitled *The Chinese Written Character as a Medium for Poetry*, Pound insisted that the origin of each character "is constantly visible" in the shape it takes on the page. This was a delusion less harmful than some of Pound's views in fields such as politics, race, religion, and economics, but it's one he clung to just as tenaciously—held onto, in Professor Kraus's splendid phrase, "with the true conviction of an ignorant blowhard."

For readers interested in those specific instances of a pictograph's growing through the centuries into an ideogram with the same meaning (and usually acquiring a number of other definitions along the way), a handsome little book has just been published: **The Nature of the Chinese Character** by Barbara Aria and Russell Eng Gon (Raincoast, \$17.95). But Professor Kraus's study is far more complex and ambi-

tious, a kind of interdisciplinary social and political history.

During the Qin dynasty, beginning in the third century B.C., characters were made uniform throughout China while spoken Chinese, of course, continued to mutate. For more than 2000 years, this great reform "preserved national unity where otherwise China might well have been fragmented, European-style, into smaller states." But it also entrenched the traditional role of calligraphy as the preserve of scholars and the learned classes.

In our own age, the Chinese communists, unable to eradicate either the practice of calligraphy or the artistic impulse behind it, had to adopt the art for their own purposes. Many characters were simplified to make them easier for the peasantry to learn. But the result was ultimately only to make the curious combination of art and ideology even stronger—and stranger. The Red Guards brought their destructive wrath to bear on the country's treasures of calligraphic art, as esteemed practitioners were persecuted and collections destroyed. At the same time, however, Mao Zedong's calligraphy (seen, most widely and famously, in the nameplate of the *People's Daily*) was elevated to the status of a cult. In a way, the relationship between brush and power hadn't really changed.

The most famous Chinese calligrapher was Wang Xizhi who lived during the Eastern Jin dynasty (317-420). No samples of his work survive. Yet as Professor Kraus puts it, Wang is as important in China as Shakespeare, Bach, or Michelangelo are in the West. Perhaps more so, in the sense that, as Professor Kraus says, "Calligraphy bears a weight of tradition not easily imaginable to

Westerners, especially to Americans." A beautiful hand came to seem the symbol of a cultivated mind. The long fingernails of the mandarin were intended not only to show that the person had no resort to manual work but also to steady the hand during the act of writing.

Even when only a tiny percentage of the population was literate, calligraphy became intricately stratified. Even today a "certain tension endures between the handwriting of state clerks and the expressive art of the literati." Despite that, the health of calligraphy in general somehow became tied to that of the whole nation. At least partly for that reason, the calligraphy of powerful personages was always being sought out (as it still is today, when public figures are often asked to letter the title-cards used at the start of television programs). In 1920, when a young Mao Zedong opened a bookstore in Changsha, he asked the local governor to produce the lettering for his shop sign. The request was not inconsistent with the idea of being a young radical.

As chairman of the communist party, "like the emperors of old, Mao was frequently asked to write inscriptions. With no evident irony, he used his classic calligraphy to call for revolution in Chinese culture." In fact, the communists did indeed diminish the classical tradition of calligraphy. That much was implicit in Mao's own writing, a rough version of the style called "grass hand," which, as he practised it, "sprawls grandly across the page and is quite difficult to read." But the change was neither so great as wished by the Red Guards, who "regarded calligraphy as an obnoxious vestige of feudalism," nor so extreme as the Taiwanese would always claim. What



stayed constant, rather, was the role of calligraphy in politics.

It was partially through the medium of his calligraphy that Hua Guofeng tried to consolidate power after Mao's death (but lost out to Deng Xiaoping). It was through big-character posters, conversely, that democratic opposition to the regime has been voiced, as witnessed at the Democracy Wall in 1978 and at its culmination at Tiananmen Square eleven years later. In today's uneasy atmosphere, when there has been at least some economic liberalization, however closely monitored, a flourishing free market has developed for examples of the best contemporary calligraphic art, particularly among collectors from elsewhere in Asia. And among the generality of Chinese themselves, there has been no diminution of popular interest in brush-writing as a means of self-expression and self-improvement. One recent calligraphy contest drew more than one million contestants.

**B**RUSHES WITH POWER WOULD BE EASY to overlook because it's a modest-looking volume. **Nature's Strongholds** edited by Robert Burton (Oxford University Press, \$63) would be easy to overlook because it's so big and lavish and full of expensive colour photography—just like hundreds of such books on historical or nature subjects that appear every year, most of them putting page design before content, all of them chasing the elusive gift-buyer. In fact, *Nature's Strongholds* is a sort of ecological atlas of the world's regions, with thoughtfully created maps, charts, and copy-blocks to support texts about each region, showing not only how they fit together in the natural order but how environmental abuses to one have added to the injury of the others.

One test of a book like this is to see if it tells you anything you didn't know about your own backyard. The section on Canada is exhaustive and revealing. It goes to some pains to compare conditions in the North with those in similar parts of some



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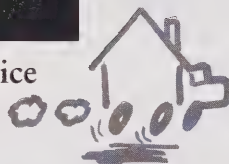
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### BOOKS CONTINUED

other countries, and it correlates the history of the national and provincial parks systems with the political awareness of the damage done to the ecosystem since the Second World War. Such subtly pragmatic connections are evident throughout. When the book gets to Russia and discusses the attempts to check the pollution of Lake Baikal in Siberia, the message between the lines is that the new torrent of information coming out of Russia and Eastern Europe is likely to contain worse news about the environment than we're prepared for.

SOME OTHER NEW BOOKS OF INTEREST to *Rotunda* readers:

• **Science and the Past** edited by Sheridan Bowman (University of Toronto Press, \$40) is a sort of print symposium, produced under the auspices of the British Museum, on current ways science is used in historical, and especially archaeological, investigation. Like all collections of papers by many different hands, the overall result is uneven, but there's much to learn about simultaneous activity in various fields. And who better to tell us than the relevant experts? The message: we've come a long way since carbon dating was the last word. Especially revealing is the chapter on computer technology and mathematics as used in archaeology and the curatorial field.

• **To Save an Elephant** by Allan Thornton and Dave Currey (Doubleday, \$27.50) is the somewhat breathlessly written story of how the two authors and a few other people carried out a dangerous investigation of the illegal ivory trade in Africa in the 1980s: at that time 2000 elephants a week were being killed, mostly for the benefit of artisans and dealers based in Hong Kong. It's like a book about drug trafficking or arms dealing in that many of the same types of characters cross the stage: spies, corrupt officials, cartel warlords. The ivory trade was finally banned in 1989, thank God.

• **The Sacred Earth** (Douglas & McIntyre, \$60) by Courtney Milne, a



globe-trotting nature photographer based in Saskatoon, comprises images of those places, whether natural or made by humans, which somehow, by consensus ancient or modern, have come to be seen as spiritual, even holy. Thus there are photographs—and almost always rather striking ones—of ancient cities, ancient monuments, and genuine religious shrines. The idea is sound, the photography varied and attractive, but the selection often seems arbitrary and the text is weak.

• In writing **With Ptarmigan & Tundra Wolves** (Orca, \$16.95 paperback), Cy Hampson, who was chief editor on the much-admired reference *Alberta, A Natural History*, sets out the results of studies he made in the western and central Arctic to determine how various animals (not merely those of the title) have adopted certain behavioural responses to the conditions found close to the Pole. In the process, he tells his own story in an honest, unadorned way, revealing a good deal about the stamina needed for sustained research in the field, and giving glimpses of how communities such as Inuvik have grown since the 1950s and early 1960s.

• Remember the *Whole Earth Catalogue*, which tried to keep alive crafts and folk customs for the benefit of back-to-the-landers? But in the North there is still a kind of joyous, 1960s' amateurishness about such enterprises. Alaska has a whole series of large-format paperbacks dedicated to local practices and lore, and the Yukon had one too: *The Lost Whole Moose Catalogue*, published by Lost Moose Publishers of Whitehorse. Now comes a sequel: **Another Lost Whole Moose Catalogue** (Firefly Books, \$19.95). The usual mixture of tall tales, recipes, survival skills, nature information, and building plans for log cabins is topped off with a few additions peculiar to the present time, such as articles on AIDS in the Yukon.

DOUGLAS FETHERLING

*Douglas Fetherling is literary editor of the Kingston Whig-Standard*

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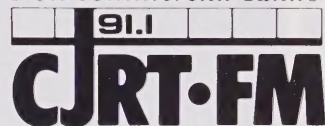


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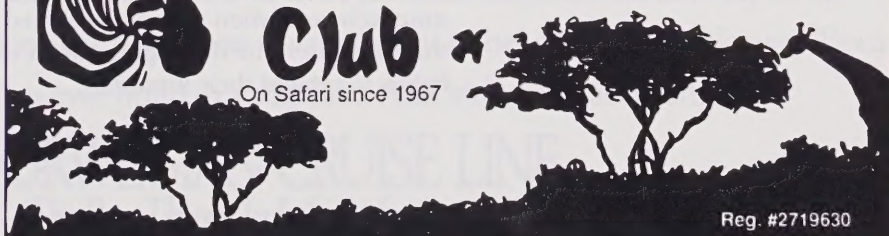
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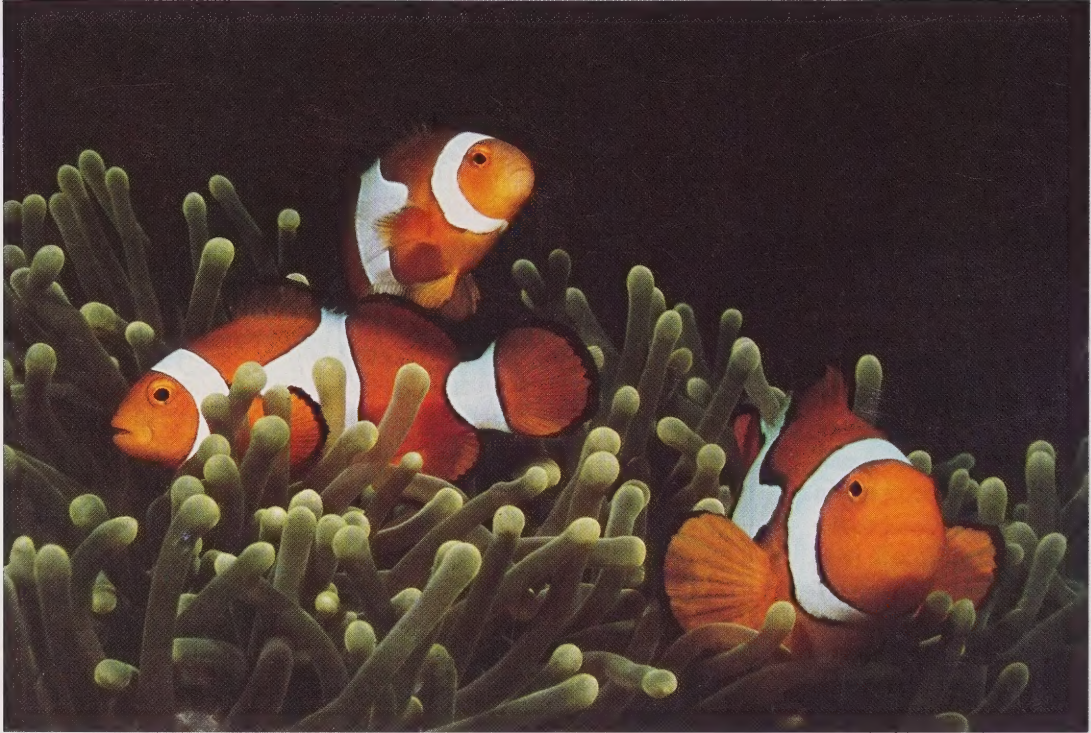
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